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BIOLOGICAL DIMENSION OF THE VALUE THEORY
OF THE ANISA EDUCATIONAL MODEL

A Dissertation Presented

By

S. Pattabi Raman

Submitted to the Graduate School of the
University of Massachusetts in partial
fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

August 1974

Major Subject: Educational Theories and
Curriculum Development

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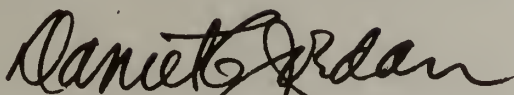
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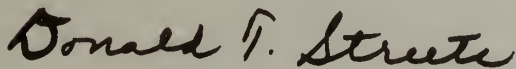
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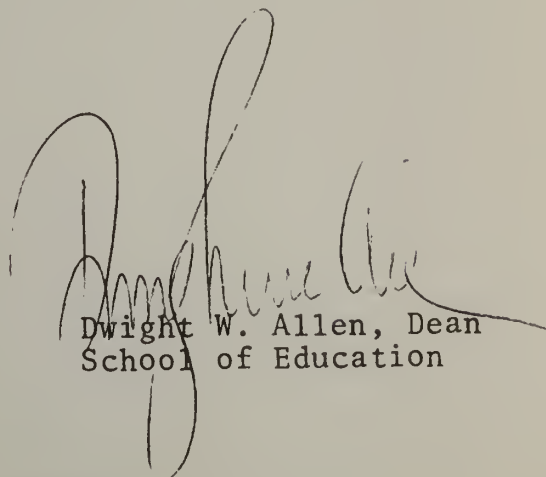
Daniel C. Jordan, Chairman of Committee



George E. Forman, Member



Donald T. Streets, Member



Dwight W. Allen, Dean
School of Education

August

1974

DEDICATION

To my dear parents who gave me the gift of life
and started me on the journey of my quest for its relevance.

ACKNOWLEDGEMENT

The completion of this endeavor which started about thirty months ago was made possible by the enthusiastic support and genuine understanding of many who have become a part of my professional and personal life. Words cannot do full justice to the encouragement and constant guidance I received from Professor Daniel C. Jordan, Chairman of my Committee. His exemplary dedication to excellence in providing quality professional direction in all of his undertakings, a virtue on the wane in academic circles, has been one of the greatest sources of inspiration in this effort. His indefatigable energy, which met its ultimate test as he tried to read every sentence of the manuscript, and his constant emotional support during my periods of fatigue and depression will long be remembered and greatly appreciated.

A special note of thanks to Dr. Donald Streets who as a member of both my guidance and dissertation committees has provided the much needed encouragement, invaluable professional criticism and perspective which helped to keep both my graduate program and this inquiry from becoming chaotic. I am grateful to Dr. George Forman whose keen insights and probing questions helped me in defining and redefining some of the basic concepts and strengthening some of the weak points in the manuscript. Thanks are due

to Dr. William Greene who kindly consented to be the Dean's representative at the final examination and read the dissertation during the last week.

I am greatly indebted to my beloved wife, Michelle, without whose selfless efforts, moral support and fortitude it would have been virtually impossible to undertake the task. My achievement in this effort is in no small measure a result of the tolerance and patience of my wife and our little daughter Shakuntala, in living in far from ideal conditions, amidst severe financial constraints, with an often pre-occupied husband and father.

It is a pleasure to express my deep appreciation to my cherished colleagues in the ANISA team particularly to Miss Magdalene Carney, and Dr. Patrick Conway for many fruitful discussions, and in providing full cooperation, but I wish to make it clear that they bear no responsibility for the limitations in this submission. I am thankful to the courteous and hard-working staff of the University of Massachusetts Library, especially to Mrs. Louise Addison.

My thanks are due to Miss Linda Giardina for typing the first manuscript and to Mrs. Ann Cetto for the truly professional and meticulous care with which the final manuscript was given this exquisite finish.

ABSTRACT

Biological Dimension of the Value Theory of the
ANISA Educational Model (August 1974)

S. Pattabi Raman, B.Sc. (Hons) Delhi
M.Sc. (Tech) Calcutta
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Directed by: Professor Daniel C. Jordan

The dissertation undertakes two tasks: (1) a discussion of the major issues that must be dealt with in formulating a comprehensive value theory for education and show how the ANISA Model in its present state of development is handling those issues; (2) establishment of empirical and theoretical referents from the biological sciences to undergird the deductive formulation of the ANISA value theory.

Perspectives obtained from the current theories proposed by axiologists, social psychologists and cultural anthropologists point out to one basic concern. No matter how comprehensive becomes our understanding of value phenomena and their ramifications in man's becoming, we still need a set of conceptual guidelines from some other dimension of human reality which will serve as a general frame of reference to validate the postulates of the value theory. Starting from ANISA's definition of value as the pattern of structuring of the energy accrued as man actualizes his potentialities, the submission discusses the factors involved

in such structuring and makes a case for broadening the paradigm of value inquiry by including subjective aim and ideals which in the ultimate analysis serve as a blue print for structuring actualized potentialities -- for creating values.

The views obtained on the nature of man and his destiny from the vantage point of modern theories of biological evolution, as represented by the works of Julian Huxley, Waddington and Pierre Teilhard de Chardin, clearly indicate the crucial role of the emergence of consciousness in man's future evolution. These theories of emergent evolution sound the death knell of both the materialistic and vitalistic views of the universe thus supporting the Whiteheadian 'organismic' view of the universe, which forms the philosophical underpinning of the ANISA model.

The evolution of consciousness has given man the propensity to be aware of the unknowns in his environment and the capacity for structuring the unknowns by forming of ideals. The ideals function as a 'lure' towards future possibilities and thus become the chief determinant of the homeorhetic path of becoming and thereby the effective instrument of collective evolution of mankind. A theory of value is in essence another facet of the theory of being and becoming. By consciously choosing ideals man restructures his pattern of energy utilization and thereby restructures his values and value systems and takes charge of his own destiny.

The subjective aims or the ideals that serve as the 'lure' for the structuring of the pattern of utilization of human energy obtain their validation on the basis of whether or not they facilitate, both in ontogenesis and phylogenesis, the kind of homeorhesis that places mankind into chreods leading to greater levels of collective organization and human solidarity -- conditions which guarantee and increase the quality of survival.

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C H A P T E R I

INTRODUCTION

The most common battle cry of reform movements in education throughout history has centered around the irrelevance of educational goals and practices to the needs and exigencies of the day. Never before has the cry been so desperate and heart-rending than today, a portentous juncture in human evolution, as man stands poised with a feeling of impotent perplexity, at the summit of the "Great Divide" -- where he can make a conscious choice either to turn in the right direction and enter a new world of justice, peace and tranquility -- or he can continue downwards along the old way of injustice, war and turmoil -- a course which leads inescapably to the extirpation of the human race.

About two generations ago, H. G. Wells wrote that mankind was engaged in a race between education and catastrophe, for he was acutely conscious of the cleavages within our culture, fissures which, as they widen, will in time prove to be calamitous. The race was almost lost in the horrors of Nagasaki and Hiroshima. In the midst of the nuclear holocaust unleashed by men, the idea took shape in the minds of some other men with lofty and far-sighted vision, to prevent repetition of a similar catastrophe and to work together for the emergence of a new and universal fraternity of mankind through education. This was to be achieved by

acting on man himself, the cause of the catastrophe, by appealing to what is most noble in him. As an embodiment of an effort to use educational, scientific and cultural instruments for humanitarian ends on an international scale, the United Nations Educational Scientific and Cultural Organization (Unesco) took shape in 1946 under the auspices of the United Nations. It was the first attempt to create a public institution in which ideas, rather than individual or political power, were to be the acknowledged instruments for achieving the "intellectual and moral solidarity of mankind." With a clear mandate to revamp education and educate mankind for a world community, with its specialized agencies and committees, and all the financial and intellectual resources it could muster, Unesco went about its business with none other than Julian Huxley with his great intellectual and cultural prestige, energy and humor, as its first director general. This unprecedented gigantic international undertaking in educational planning and reform caused a spectacular educational "explosion," creating a new awareness and ushering in a highly dynamic decade for education in all countries. Long muted human rights came to be openly declared and vigorously pursued, including the right to education. (Hersch, 1969.) Education became accepted by economic policy-makers not merely as a desirable social service but as an essential sector for

overall national development. Unesco declared educational planning one of its top priorities, developing its program by supplying educational planning experts to more than eighty countries and by establishing regional and international training and research centers.

World Crisis in Education

Despite spectacular educational expansion, there were many disappointments in educational planning. A world survey of problems and prospects in educational planning reports:

There was as it remains today, a great gap between words and deeds -- between policies proclaimed by ministers attending conferences and the actions taken in their countries; between methodologies prepared by theoreticians and their application in the actual planning process. The many educational planning units often remained understaffed without effective links, -- isolated from the main stream of educational decision making. Meanwhile, in the absence of overall integrated planning, basic educational priorities vacillated -- jumping from primary education at first to vocational training, teacher training, secondary general education, higher education and finally to adult literacy training. The inevitable result was the emergence of wasteful imbalances both within the educational system and its environment. (Unesco, 1970, p. 10.) (emphasis mine)

Recognizing the inadequacies of earlier piecemeal, short range and unintegrated educational planning, many countries wrote new prescriptions which, among other things, demanded that educational planning should have "a comprehensive coverage, embracing all levels and parts of the

educational system in a single view including qualitative and quantitative aspects" (Unesco, 1970, p. 11). If one seeks dispassionately for reasons why education was not more successfully planned and implemented to meet the immediate and future needs of the world's peoples, the explanation may be found in a combination of external and internal constraints of the planning operation. Soon it became evident to the planners that:

...without a clear idea of its objectives, an educational system is as a ship at sea with no destination; it cannot plan its course and can end up simply turning circles. A nation's educational objectives, reflecting society's idea of its own future, must be decided by the society as a whole and its chosen leaders. The idea of the future should embrace basic human values, ethical, cultural and aesthetic, and also the various roles the individual will be required to play in society, as a citizen, worker and member of a family. In translating these overall goals into educational objectives those responsible for educational planning can help by insisting that there be reasonable consistency and an order of priority among various objectives, since not all of them can be pursued at full speed simultaneously. They must make sure that the definition of objectives and their priority rating is understood as a continuing process that should be periodically reviewed (Unesco, 1970, p. 12).

Following the enactment of the International Education Act of 1966, President Lyndon Johnson called for an international conference "to stimulate deeper mutual understanding among nations of major educational problems facing the world." The proceedings of the conference on "World Crisis in Education" thus convened in Williamsburg, Virginia in 1967, provided us with a general index of the

current thinking on the crisis in education we face today and bring to a sharp focus the deep-seated maladjustments in most educational systems that are hurling us to the vortex of a crisis (Bereday, 1969).

Education and the American Scene

While previous pages depict the magnitude of disparity between expectation and achievement in education in the international sphere, on the American scene, education is passing from crisis to disaster in its quest for relevance. Few undertakings in contemporary American life have provoked such continuing controversy as education and its institutional operations. A plethora of articles, countless speeches, books, and numerous conference reports play endless variations on the same platitudinous theme lamenting the built-in-inertia of the educational system that insulates it from change and self-renewal. The tone of this lament is reflected in the following cogent analysis:

At every level of the education professions the pressure is felt and the complaints registered. Jacques Barzun documents how "drudgery, discipline, and conformity" constitute the basic syndrome of traditional education. George Leonard condenses a complex diagnosis into one simple statement: "The ecstasy has gone out of education." Paul Goodman, in Compulsory Miseducation, describes education as a system of brainwashing which leads to "spiritual destruction." Carl Rogers views the educational system as a kind of prison where the person is not free to learn; John Holt describes the many ways in which the system programs a guaranteed failure for significant numbers of children. Kozol details how education mediates

"death at an early age." Weinstein and those interested in humanistic education view the current system as one which often punishes an expression of feeling and renders the process of acquiring knowledge a sterile, mostly irrelevant, and even destructive experience. Silberman's efforts at diagnosis indicate that education is in a period of serious crises. As a system, it does not address the development of the whole person; rather it fragments, compartmentalizes, and precipitates self-alienation. Herbert Kohl points to the authoritarian atmosphere of the traditional school and how it snuffs out the life of learning. Caleb Gattegno argues that learning is the life of education and in order to sustain that life, teaching must be "subordinated to learning." Yet, in many schools learning is subordinate to everything else. William Glasser, in Schools Without Failure, illustrates how education's ill health is directly correlated with "a philosophy of non-involvement, non-relevance, and a limited emphasis on thinking" (Jordan and Streets, 1974, p. 1).

Leaders on every level of American society, from the Presidency to the local Parent-Teacher Association, concur on the desperate need for educational reform.

From the vantage point of the year 2000 if not earlier, the last decade of education will undoubtedly appear as the most bizarre in terms of the methods it used when compared to other human intellectual endeavors. Education is passing from crisis to crisis because as a discipline it neither begins its endeavors with tested principles, nor is there any plan to test the principles on which the endeavors are launched. There is a great deal of what is called 'experimentation' going on in American education, but most of it can hardly be called experimentation in the scientific sense since it is not

conducted with any set of controls. The fact that something is simply new does not make it experimental. We are confronted today with a body of beliefs and attitudes about education, which, although they are the determining influence in our educational system, have not been subjected to careful analysis. The American Educational Research Association identified two significant characteristics of the condition of research in education: disorganization and lack of orientation to other behavioral sciences. It went on to say

...by disorganization we mean the condition in which, at present, research too often proceeds without explicit theoretical framework, in intellectual disarray, to the testing of myriads of arbitrary, unrationalized hypotheses (American Educational Research Association, 1953, p. 657).

Educational research must eventually come to mean more than an endless testing of hypotheses that are unconnected and trivial. It must include an inquiry into educational objectives and a questioning of assumptions underlying them in an attempt to find a unifying frame of reference from which explicit criteria for determining the relevance of objectives and their priority.

Compounding the shortcomings in educational research methodology is the knowledge explosion of this century. Until recently, the main task of education has been considered the transmission of the traditions and information processed by the society to new generations. In a

relatively static situation, this has meant that the teacher has but to communicate his own knowledge and experience acquired in turn from his own teachers. In a world dominated by change, with the reservoir of human knowledge spectacularly swelling beyond imagination within the lifetime of the teacher, nay even within the educational cycle of the student, and with the growing aspirations of societies in the light of modern technology, much of the knowledge, and many of the methods and attitudes of the past have become obsolete.

Need for New Directions

Without belaboring the obvious any further, it will suffice to say that there is an imperative need for new goals, purposes, methods and directions in education on all levels: local, national, and international. There is a growing recognition of a great need for a distillation of the thinking of the past half century and for an understanding of the direction being taken by education. To chart a rational course towards its objectives, we need to know how the educational system originated and what discernible forces in the past and present are likely to affect its future. For such a diagnosis, we must use all the instruments at our disposal. Major blind spots in an educational system will seriously impede plotting a reliable future course.

The conclusion seems inescapable that if education is to make its proper contribution to the growth of the individual and the society's development, then educational systems everywhere must apply the methods of science and undergo sweeping revolutionary changes, as with medicine, engineering and technology, and other fields of hard sciences have already done and are still doing. A dynamic transformation of the educational system which will enable it to cultivate adjustment to change and make innovation fruitful can come only when education adopts the methods of science, which has opened to modern man worlds of inconceivable dimensions -- submicroscopic to supergalactic.

To apply scientific methods to education requires articulating a comprehensive body of theory which will address the fundamental problems and issues facing education and which at the same time will serve as a definitive guide to practice. The effectiveness of the application can and should then be tested out over periods of time. Theories enable us to subsume under a few principles a vast array of what may first appear to be unrelated facts. Rene Dubos, the well-known microbiologist of the Rockefeller Institute, once wrote that after a review of all the important scientific discoveries of the last couple of centuries -- such as those of Darwin, Freud, Einstein -- he found that not one of them was a result of piling up

fact on fact. The discoveries resulted from the scientist's perception of the significance of the relationships and the meaningful pattern among facts, which then gave rise to the resultant theories. (May, 1967, p. 48.)

Education has yet to find a way of becoming a scientific enterprise carried on by a self-governing community of inquirers who conduct themselves in accordance with an unwritten but binding code, bowing to the constraints of theory and yet having infinite scope for original and innovative research to refine the theory. In such an enterprise, theory has the role of a self-correcting device or internal guardianship as a basic element. Unless education has some such criteria which can be used as a corrective instrument for the procedures involved, it can never emerge as a science on its own standing.

The need to establish a science of education is confirmed by the following statement of a former Associate U.S. Commissioner of Education:

In principle, the American educational commitment has always been that every child should be educated to his full potential, but this commitment has been voiced in terms of resources such as teachers, books, space, and equipment. When a child has failed to learn, school personnel have assigned him a label -- slow, or unmotivated, or retarded. Our schools must assume a revised commitment that every child shall learn. Such a commitment must include a willingness to change a system which does not work and define one which does, to seek causes of failure in a system and its personnel instead of focusing solely on students (Lessinger, 1974).

The history of American educational practices during the past fifty years verifies the repeated attempts made to formulate a theory of education. But what seemed to be lacking was a 'science of man' on which to build its theory, and this science of man was initially sought from psychology. Because of the characteristic relation between psychology and education, psychological theories have always intrigued educators. Most educational theories are spin-offs of major theoretical developments in psychology. For example, Gestalt psychology, field theory, psychoanalytic theory, and stimulus-response theory, which were formulated to explain some aspects of behavior and learning, were tried out in educational contexts and continue to be explored by educators. Contributions of James, Watson, Dewey, Thorndyke, Freud, Piaget and Skinner no doubt conferred an air of scientific respectability to educational practice. The weaknesses of the theories, Schwab observes:

...arise from two sources: the inevitable incompleteness of the subject matters of theories and the partiality of the view each takes of its already incomplete subject. Incompleteness of the subject is easily seen in the entirely cognitive theory which takes no account of the emotional needs and satisfactions.... Incompleteness of the subject is also visible in personality theories which reduce the whole society to an appendage of personality and in sociological theories which reduce personality to an artifact of society. Partiality of view is exemplified by the Freudian treatment of personality after the analogue of a developing, differentiating organism, a treatment which makes it extremely difficult to deal directly with problems of interpersonal relations (Schwab, 1970, p. 11).

These weaknesses, characterized by a lack of comprehensiveness, undoubtedly vitiate the value of a theory.

In his search for a relevant educational theory, McDonald has enumerated the kinds of characteristics any psychological theory must have to win a significant place as an educational theory and practice:

In the first place, its scientific character must be impeccable.

Secondly, since education is a social enterprise, the theory must be social in character or must treat social problems in a significant way.

Third, the theory must account for developmental phenomena.

Fourth, the theory must promise some form of control, i.e., it has systems that lead to procedures with predictable effects.

Fifth, the theory must somehow evidence its concern for the individual (McDonald, 1964).

No psychological theory has fulfilled these characteristics and therefore no comprehensive educational theory has yet been derived. "There seems to be no good reason," argues McDonald, "for educational theory to be committed to any single theory short of a comprehensive science of man."

Scope of the ANISA Educational Model

The realization of a need in the social world has always been followed by the establishment of institutions responding to that need. Goals and ideals will never have any social effect and will always remain in the realm of

hopefulness and utopia unless they are institutionalized to bring them to the realm of specific activity. The American National Institute of Social Advancement (ANISA) was designed precisely to attempt a frontal attack to make education a scientific enterprise in response to the lack of any coordinated multidisciplinary team approach to education, its planning and implementation.

It is evident that the coherence and efficacy of any educational program designed to address the total development of man, to a large extent, lies in the comprehensiveness of its theory of the development of man -- how he comes to be what he should be. Phenix succinctly states:

The problem of man and his becoming is particularly urgent for parents, teachers, school officials and citizens concerned with the conduct of education. To choose soundly what to teach and how to teach it, to judge what educational goals are practicable and what ones are not -- such wisdom requires the best possible understanding of human nature and its transformation (Phenix, 1964, p. 3).

Furthermore, Belth writes:

The level of cultural maturity of a society can be determined by the theory it holds about education of its rising generations. For any educational theory entails a concept of the relationship between man and the world he must cope with and learn to organize and direct. It contains, too, an interpretation of the effect which one has upon the potentialities of the other and explains how this effect comes about. Such interpretative concepts suggest the procedures which should accomplish the goals implicit in a particular theory of education (Belth, 1965, p. 39).

Obviously, in the early stages of the conceptualization of

the ANISA model, articulating a theory of development -- of man's being and becoming -- was the first order of business.

Where is this knowledge of man and his becoming to be obtained? More than thirty years ago, Alexis Carrel wrote that Man has been unable to organize himself because he did not understand his own nature (Carrel, 1939). Unfortunately, there is no single brand of specialists to whom one can turn for authoritative answers about man as a total entity. As Bahm observes, each science or other area of specialty discovers something essential to the nature of man and then tries to reduce the significance of other essentials to its own. A chemist may depict the reality of man as replicating macromolecules. A physicist may explain him primarily as a complicated electrical mechanism. A biologist may claim him as solely a creature of evolution. A physiologist may view him entirely as a product of his organs, glands, diet, diseases and their development. An anthropologist may depict him as only a product of his culture. A social psychologist may describe him as a victim of his social environment. A linguist may believe him to be completely molded by his language. An artist or musician may see man as primarily an aesthetic being. Each of these specialists has a contribution to make to man's understanding of himself. Bahm concludes, "But whenever a specialist of any kind tries to reduce the whole of man to any one part of him he makes him somewhat

antihumanistic" (Bahm, 1964, p. 349).

Sorting out this dilemma required a broader conceptual framework which will integrate purposefully all that is known about human growth and development. This broader framework was to be found in a philosophy which contains the most comprehensive view of the nature of man. To be comprehensive in its scope, a theory of development must emerge from such a philosophical base -- one which explicates the nature of man, his purpose and potentialities, and how he comes to know, feel, and act. Drawing heavily on a Whiteheadian expression of the philosophy of organism, the ANISA Model views man as a creature at the apex of creation whose reality essentially inheres in the process of his becoming -- translating his unlimited potentialities into actuality (Jordan and Shepard, 1972). From this philosophical base, a set of coherent, mutually compatible, complimentary theories¹ of development, curriculum, pedagogy, administration, and evaluation have been generated (Jordan and Streets, 1973). (See flow chart, p. 16, Fig. 1.)

Theory refers to a system of propositions and definitions which explain particular phenomena and how they are

1. Because a fuller explanation of the theories is beyond the scope of this submission, a summary statement on the ANISA Model is appended (Appendix).

ANISA MODEL*

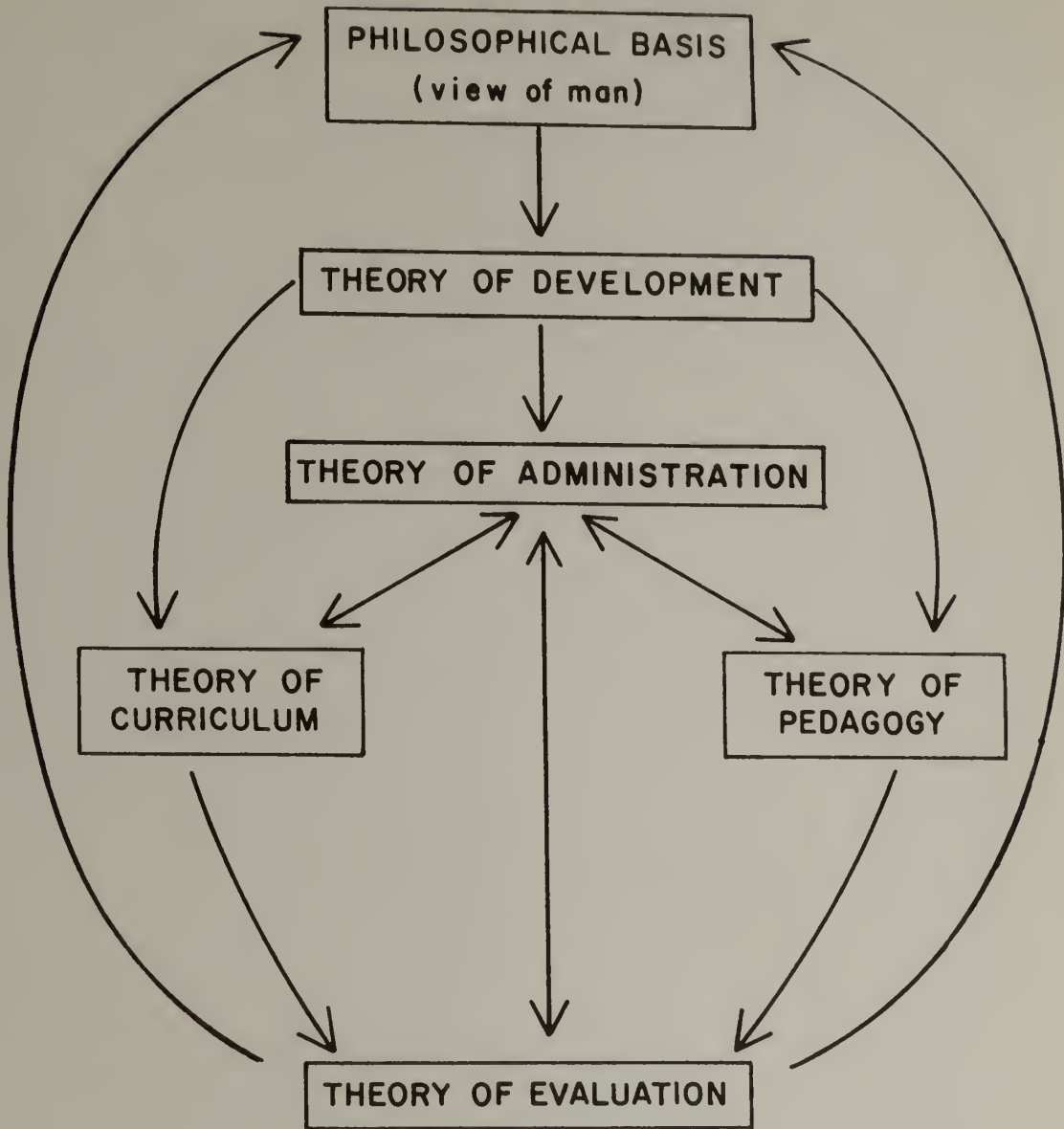


FIG I

*

Jordan, D. C. and Streets, D. T. Releasing the potentialities of the Child: A new perspective on child-rearing, day care and early childhood education. Unpublished manuscript. 1972

related. The propositions may be arrived at inductively and/or deductively and can be used to generate specific hypotheses which can be empirically tested. The Euclidean system for geometry is such a system. Furthermore all theories in the most exact of our natural sciences -- such as quantum theories in physics -- comprise such a system.² There is no a priori reason why similar deductive and inductive procedures should be impossible in the construction of educational theory. For the construction of such a system to understand man and his becoming, it is necessary that the system not only fulfilled the logical requirements of consistency and non-contradiction, but also integrates the entire phenomena of human experience. The cosmology of Whitehead provides a conceptual framework for such an integration which serves to identify and order all the constituent parts of the process of education into a single coherent system.

Purpose of the Present Study

When medicine draws on the accumulated knowledge of its mother sciences, e.g., biology, and general physiology, for curing the ills of the human organism, it need not

2. A fuller discussion of this idea is provided by Werkmeister, W. H. in "An Epistemological Basis for Quantum Physics," Philosophy of Science, 17, 1950, p. 1-25.

hesitate about the goals to be attained or the methods to be used. It has a clear mandate to exploit the distilled knowledge of the advanced sciences while itself contributing to the development of intermediary disciplines like pathology, pharmacodynamics, etc. In contrast, when education seeks to apply the advances in psychology, sociology, anthropology and other disciplines that have to do with man and his development, it is confronted with a tangle of questions concerning not only ends but also means. Issues debated in education can be divided into two broad categories: those which explore the relevance and relationship of other human sciences and related disciplines to education and those which consider questions purely internal to the process of education, defined more or less in terms of a profession. There is extensive experimentation and innovation going on in American education mostly in the later category and this, to a great extent, accounts for its superficiality and inability to strengthen education as a dynamic agent for social change.

With the one exception of psychology, the advances in the mother disciplines of education, viz., sociology, anthropology, philosophy, biology, aesthetics, religion, receive relatively minimal attention from present-day educators. The reason for this complacency and apathy is twofold. The first is the myopic vision of the present-day educators when they come to defining the purpose of

education itself. Solution of this problem, which constitutes the ultimate test for the educators, is of paramount importance in the microcosm of education for it becomes decisive in the macrocosm of the child's future. The second, closely related to the first, is the academic aloofness of many educators, rationalized in the name of scientific objectivity, in dealing with the problem of VALUE which pervades and undergirds all other sciences that study man and his development. These sciences consider value as a major area of concern and indeed a challenge to the progress and relevance of their respective disciplines.

While everyone is ready to affirm the basic importance of values in education, few educators have really taken the arduous task of probing into the nature of values, their origin, their sanction, their growth, and their relevance to the process of education. It would be widely agreed, as Hardie affirms, that the deadlock in formulating any educational theory that could be translated into educational practice relevant to modern societal needs, will center around the nature of value (Hardie, 1961). It is an oversimplification, but generally true, that many educators feel that socially acceptable values could be developed by self-discovery and experimentation by the young, but the degree to which teachers, parents and other adults should intervene in this process remains in doubt

for many. They tend to emphasize the need for informed and rational judgment in the value-building process without any clear notion as to what ends the value-building process should be aimed at. Because of inattention the study of values remains, in Brameld's words, "the most neglected problem in American education" (Brameld, 1966, p. 151).

The modern distrust of values as something emotional and illusory and the virtual disappearance of value theory in current deliberations on education only reflect the state of chaos and confusion of the field itself in respect to its goals and purposes. No knowledge of lasting interest can thrive in an intellectual climate where values are at a discount. Recognition of this vacuum inspired an attempt to formulate a unified theory of value during the conceptualization of the ANISA COMPREHENSIVE EDUCATIONAL MODEL. It soon became apparent that the knowledge needed for generating a value theory in the ANISA Model should be sought from a comprehensive knowledge of human growth and development studied from every possible angle by any promising method consistent with the philosophical base of the model and its redefinition of the process of education. Hence studies had to be aimed at a unified treatment of man's values on different ontological levels of human endeavor and evolution, viz., biological, psychological, technological, sociological, aesthetic, and philosophical. As Whitehead (1933) remarked, "Ideas and values have no

existence or real importance until they are made an integral part of some concrete entity -- in this case until they are made an integral part of life and personality of the growing organism."

The purpose of this study is a) to submit for consideration a discussion of the major issues that must be dealt with in formulating a comprehensive value theory and show how the ANISA Model can in its present state of development handle those issues fully and satisfactorily, and b) to establish empirical and theoretical referents from the biological sciences to undergird the deductive formulation of the ANISA value theory.

C H A P T E R I I

EDUCATIONAL THEORY AND THE PROBLEM OF VALUE

One of the traditional epistemological problems which educators share with philosophers is that of facts versus values. As Cooper (1954) observes, the problem has always been "susceptible to confusions of linguistic and philosophical considerations on the one hand, with empirical and scientific considerations on the other." This is true especially when practical methods of education are the ultimate concern. The educator has the task of relating both philosophy and pure science to the applied science of education and on this basis construct an educational theory.

One often wonders if there ever will be a time when educators will be free from questions of problems relating to their aims and purposes. In every age, educators not only face new problems unique to their times, but they also have the obligation to redefine many old problems in the light of present conditions. A spokesman for his age, Aristotle, said,

As things are, there is disagreement about the things to be taught, whether we look to virtue of the best life. Neither is it clear whether education should be more concerned with intellectual or moral virtue. The existing practice is perplexing; no one knows on what principle we should proceed -- should the useful in life, or should virtue, or should the higher knowledge be the aim of our training; all three opinions have been entertained. Again about the means there is no agreement; for different persons,

starting with different ideas about the nature of virtue, naturally disagree about the practice of it....¹

The concerns expressed in the above statements of Aristotle as to the aims of education still continue to occupy the priority list in the agenda of any meeting of the present day educators. They find themselves ever increasingly drawn into the labyrinth of conflicting ideologies. Contemporary conditions have in fact exacerbated the problem, as the following remarks of Childs indicate:

In order to encourage, we must also discourage; in order to foster we must also hinder; in order to emphasize the significant, we must identify the non-significant; and finally in order to select and focus attention on certain subject matters of life, we have to reject and ignore other subject matters. Were our values different our selections and our rejections would also be different. The process of selecting and rejecting, of fostering and hindering, of distinguishing the lovely from the unlovely, and of discriminating the important from the unimportant is unending in education (Childs, 1950, p. 19-20).

It is tempting to become cynical and witty about the ways the educational institutions cope with the conflicts, especially when one is a bystander. Obviously, the institutions are involved with value choices and judgments which cut to the core of human concerns for many aspects of value

1. Aristotle's Politics. Jowett translation. Oxford: Clarendon Press, 1885, p. 245.

increasingly pervade and undergird the whole process of providing and guiding experience in an educational setting. Indeed it is difficult to conceive any sphere of activity that an educator is involved in that would not deeply involve some aspect of value. When we talk about educational reforms, we are not just talking about revamping education, but are in a way debating the kind of society we desire, the kinds of priorities the society should be committed to and the kind of life we wish our future citizens to pursue. Again, since education is a social enterprise and a human pursuit, different ideas about what its purpose should be arise from different concepts of a) man's destiny, b) what must man do in order to prepare for this destiny? c) what constitutes human nature? These are issues which move out of the realm of traditional education and concern the very fabric of our civilization. In that sense, they are universal and timeless. Differences in educational practice -- in courses of study, teaching methods, patterns of support and control -- are only reflections of different beliefs about such matters as human nature, nature of knowledge, and value. These beliefs are the foundations of any educational philosophy -- thus an educational theory -- which guides the course of action.

Value Theory and Educational Practice

To those who are committed to the profession, education

implies the transmission of both facts and values that are worthwhile and not detrimental to the youngsters.

There is an uneasy feeling on the part of educators, especially curriculum specialists, that while facts are well taken care of by various sciences, something called "value" is not. They are preoccupied with finding a solution in an academic context with "objectivity," i.e., through the respectable method of historical, anthropological, sociological, and logical analysis. They have found no satisfactory answers.

Curriculum is much more than a timetable and a description of the subject matter to be taught. It lays down principle objectives of teaching, the attitudes which should be developed in pupils toward learning and about life in general, the skills which education should promote. The entire complex of educational objectives and the ways and techniques by which they are achieved must be involved. Curriculum planning is an essential part of educational planning which sets out explicitly the general objectives of an educational system and the means through which these objectives are achieved.

One of the greatest weaknesses in curricular practice is the failure to treat the problems involved in making specific judgments of comparative value when we formulate our objectives. Clearly, there is a need from value theory constant guidance in making value judgments.

Basic problems in the planning and execution of major educational innovations, a report on curriculum innovation says, "is due to the...need to develop attitudes of mind towards making innovations more acceptable (OCED, 1966, p. 31).

It should be realized that any such attempt to change attitudes will have more meaning if it is shaped by guiding principles that are systematized to form a philosophical view that delineates purpose, direction, and goals. This implies the cultivation of right attitudes of mind in pupils and teachers so that they may be receptive to new developments in knowledge, and free themselves from an emotional commitment to error.

Teaching is a distinct goal-directed activity and involves a general engagement of the teacher's judgment on experience as it relates to particular goals. In teaching, we do not impose our will on the student, but introduce him to the many mansions of the heritage in which we ourselves strive to live and to the improvement of which we are ourselves dedicated.

Throwing a child in the river is not itself sufficient to teach him how to swim. Teaching normally involves showing him how to do something by action or example and not merely setting up conditions and environments for interaction under which he may flounder without guidance.

Needless to say, an adequate general theory of value

must not only clarify many matters in educational policy and practice but must extend and strengthen the philosophical foundations for an improved curricular and pedagogical theory.

Value Theory and the ANISA Model

Since all education is based on some set of objectives and since all objectives imply a prior commitment to a set of principles as to what is really worthwhile (valued) in the ultimate analysis, any discussion of educational objectives presupposes prior assumptions about the nature and scope of value. This means that the ultimate criteria for the validity of our objectives rests on the viability of the theory of value.

This will be illustrated as follows. Using a definition of education consistent with its etymology² as: The conscious drawing out of all the potentialities of the human organism by guiding its interaction with the environment in a manner so as to insure the maximum growth and development of the organism for the ultimate purpose of

2. One of the most hotly debated issues in education today is the definition and purpose of education. Even in this approach of defining education from its etymology, people have different opinions. For some the root word is "educe" or "educere"to draw out, while for others it is "educare"to bring up or rear (Peters, 1966).

achieving the organism's goal. In constructing the Model's educational theory, we had to consider the various questions which arise from such a definition, such as:

What is the nature of the human organism?

How does it differ from other forms of creation?

What is the nature of human potential?

What is the process by which the human potentialities are actualized?

How does this differ from the processes of the release of the potentialities of other biological organisms?

How does learning take place?

Is there a difference between learning and growth?

How is knowledge gained?

What are the characteristics of growth and development?

How does this relate to the learning process?

How does one evaluate the process of actualization of a potential?

What is meant by interaction with the environment?

What is an environment?

Are all environments the same?

How many categories are there?

Can the interaction be guided?

When should guidance be given? If so, how?

These are certainly some of the basic issues that any comprehensive educational theory should attempt to clarify. It is obvious that the ANISA Educational theory has subsumed under it component theories of development, of learning, of

curriculum, of pedagogy, of evaluation and of administration, etc. (see p. 16). All these theories have their metaphysical, ontological, and axiological underpinnings derived from the same philosophical base. Just as our understanding of the nature of knowledge³ (epistemology) has had a tremendous impact on the learning theory and curriculum practice, pedagogy, and evaluation, advances in the other branches of philosophy will have their impact on the above theories. It is evident that the nature of our understanding of the science of value (thereby a theory of value) will have a significant effect on the stand taken in the above-mentioned theories and consequently on education as a whole.

In terms of education, the understanding, conditions, and contexts in which values in an individual arise is of cardinal importance for it enables us to gain better control of the forces operative in the formation of human personality and in social interaction. Furthermore, men not only have values; they also make value judgments and develop the process of valuing.

3. The epistemological quest of the Genevan scientist, Jean Piaget, enabled him to generate a coherent body of theory of intellectual growth in young children; and this in turn has caused a revolution, Copernican in its scope, in developmental cognitive psychology, in curriculum planning, in pedagogy and evaluation.

Consequently, any systematic inquiry in the realm of value theory should begin by trying to answer the following questions:

What is a value? What is its origin?

What is the relationship between a value and a fact?

How many types of values are there?

Is there any hierarchy among them?

What is a value system?

How do values relate to knowing and the learning process?

Is there any process involved in the formation of values?

To what extent can a value or a value system be modified?

Are there any universals in the system of values and also in the process of value formation?

What is the relationship between values, attitudes and beliefs and the process of self-actualization of an individual?

What is the effect of a culture in value formation?

Can we evaluate the process of value formation?

Is there any ultimate criteria by which we can validate value judgments?

The above considerations may be the heart of a value theory for education since education is an arena in which all possible ramifications of the concept of value are involved. Ideally, a comprehensive theory of value will have to include a set of propositions which explicate the phenomenon of value formations and contain clear and

unambiguous definitions of the terms involved and explain the interrelationships that exist among them. Then one can ask, "What do the answers to the above questions imply for the educational process in general and to curriculum and pedagogical theory in particular?"

The goal for value theory, says Edel in a succinct statement:

...is to find the unity of value in the most systematic, historical, evolutionary picture of man from his emergence on the globe to the present day, through the various stages of his development, with whatever knowledge we have or can acquire of the appearance of the various value phenomena and process of valuation and evaluation, the changes in these phenomena, the conditions (biological, psychological, social and historical) of their appearance and their change."

Edel goes on to say that formulation of such a theory requires the

basic scope of a Darwin, the sense of internal dynamics of a Freud, the historical sweep of a Marx, the unifying penetration of a Bentham, the logical-linguistic skill of a Carnap. Perhaps I should add the sensitivity of a Dostoievski and the moral feeling of a Ghandi, and tie them all together with the intellectual energy of an Aristotle. The conclusion may be that value theory will be successfully carried out only to the extent that it becomes the collective effort of the spirit of philosophy in conjunction with the body of science" (Edel, 1953).

One has but to survey the literature in social and behavioral sciences that deal with value to be convinced of the truth in the above statement.

Status of Literature in Value Inquiry

The literature in this area is voluminous, and at the outset the task of defining the term "value" itself is beset with ambiguity and vagueness. A bewildering profusion of terms have been employed for defining the term "value" ranging from what a person wants, desires, needs, enjoys, and prefers through what he thinks desirable, rewarding, and obligatory to what the community sanctions or enforces. A few of the more popular definitions are mentioned to demonstrate the great variety and looseness of the terms employed (Baier, 1969, p. 33):

A thing has or is a value if and when people behave toward it so as to retain or increase their possession of it (George Lundberg).

Anything capable of being appreciated (wished for) is a value (Robert Part and E. W. Burgess).

Values are the obverse of motives...the object, quality, or condition that satisfied the motivation (Richard T. LaPiere).

Values are any object of any need (Howard Becker).

A desideratum or anything desired or chosen by someone, at sometime -- operationally: what the respondent says he wants (Stuart C. Dodd).

(A value is) a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available means and ends of action (Clyde Kluckhohn).

'Values' are 'the desirable end states which act as a guide to human endeavor or the most general statements of legitimate ends which guide social action' (Neil J. Smelser).

'Values' are 'normative standards by which human beings are influenced in their choice among the alternative courses of action which they perceive' (Philip E. Jacob and James J. Flink).

For Skinner values have different connotations and he writes:

"As to value, so far I can see, a value is simply a way of describing what is either immediately or in the long run reinforcing to man" (Skinner, B.F., 1961, p. 576).

In no field of human inquiry is there more semantic confusion and inconsistency in terminology as those in the field of value inquiry. Such confusion abounds because there is a lack of an organized and scientific attempt to standardize and make clear the terminology used in the behavioral and social sciences. Words which occur in every language, while perfectly adequate for the purposes of every day living, are not precise enough for making the subtle distinctions which are required in science and philosophy. Precision in thought can be attained only if the terms that are used are clear and the meanings of these terms have been carefully and precisely defined. That such precision in terminology is essential in a science becomes obvious the moment one reflects upon the multitude of specific symbols which have been developed, and which are required for rigorous and abstract thinking, in the exact sciences like physics and chemistry. In order to communicate systematic knowledge and to draw extended inferences, it is vital that technical terms be used. For example, the concept

"H₂O" has made possible formal inferences and the discovery of complex relationships between substances which simply could not have been reached through the use of the common sense notion of the term "aqua" or "water." In spite of diverse interests for a chemist, haematologist, microbiologist, and food processing technician, the term "pH" connotes one and only one thing -- "hydrogen ion concentration." The importance of technical symbols in the development of science has been so critical that the emergence of contemporary science and technology to such levels of excellence may in part be attributed to its development of a systematic and precise set of symbols. Certainly, the freedom of science from superstition and the gradual emancipation of the applied sciences from subjective biases leading to erroneous interpretations of phenomena, has had one necessary condition, the organization of a common and systematic set of terms. And, as it is frequently pointed out by contemporary thinkers (Handy, 1964), one of the major blocks to the present effectiveness of a science of sociology, or science of psychology, or a science of education, is the absence of that kind of a "language" as employed in the exact sciences.

Since the matters which philosophy deals with are far more complicated in their nature than those with which the exact sciences are concerned, philosophy historically has

had much greater difficulty in freeing itself from subjective interpretations. And certainly, until very recently, little attempt has been made to develop a common terminology for philosophic thought. Some philosophers have tried to develop a completely new symbolism for their inquiries, in which the imprecision and ambiguity of the field of philosophical discourse may be eliminated. Phenix writes that an organized and pioneer effort in the direction was made by Whitehead and Russell in their celebrated Principia Mathematica, which tried to use special and precise mathematical symbolism for expressing meta-meanings of philosophy (Phenix, 1964, p. 255).

However, in order to have correct inference about things, it is not enough merely to be precise in the statement of the definition of terms. When meaning is assigned to a term, it must not be given to it in an arbitrary way. It is necessary that the meaning be made to correspond to the characteristics of the object, event, idea or concept that the term is supposed to represent. Otherwise, there arises a cumbersome technical "jargon" no matter how systematic it may appear to be at first glance. Educational literature is particularly notorious for having developed a pseudo-technical language in recent years. Scarcely a month goes by without an article appearing which ridicules "educationalists" for their use of a

jargon that obscures and confuses rather than illuminates the real issues. As Ducasse points out a systematic knowledge is obtainable only to the degree that the terms used in thinking are both precisely defined and defined with a view to bringing a closer relationship to reality (Ducasse, 1941).

Brewster Smith draws our attention to the conceptual disarray of the definition of value in the social sciences.

But the increased currency of explicit value concepts among psychologists and social scientists has unfortunately not been accompanied by corresponding gains in conceptual clarity of consensus. We talk about altogether too many probably different things under one rubric when we stretch the same terminology to include the utilities of mathematical decision theory..., fundamental assumptions about the nature of the world and man's place in it..., ultimate preferences among life styles..., and core attitudes or sentiments that set priorities among one's preferences and thus give structure to a life.... And, at the same time, we are embarrassed with a proliferation of concepts akin to values: attitudes and sentiments, but also interests, preferences, motives, cathexes, valences. The handful of major attempts to study values empirically have started from different preconceptions and have altogether failed to link together to yield a domain of cumulative knowledge (Smith, 1969, p. 97).

Much of the confusion in value inquiry, writes Kluckhohn:

undoubtedly arises from the fact that one speaker has the general category in mind, another a particular limited type of value, still another a different specific type. We have not discovered any comprehensive classification of values. Golightly has distinguished essential and operational values; C. I. Lewis intrinsic, extrinsic, inherent, and instrumental values. The Cornell group speaks of asserted and operating values. Perry has discriminated values according

to modalities of interest: Positive-negative, progressive-recurrent, potential-actual, and so on. There are various content classifications such as: hedonic, aesthetic, religious, economic, ethical, and logical. The best known of the content groupings is Spranger's (used in the Allport-Vernon test of values): theoretical, economic, aesthetic, social, political, and religious. The objection to these content classifications is that they are culturebound. Ralph White has distinguished one hundred "general values" and twenty-five "political values" all with special references to Western culture (Kluckhohn, 1951, p. 412).

Added to this are the divergent methods and purposes of inquiry among the disciplines that are interested in the study of values. Such a state of affairs by itself necessitates some compelling theoretical basis for suggesting a systematic classification of values.

The breadth and scope of the problem of value inquiry is staggering because the issue of values occupies an important position in all the social sciences -- sociology, anthropology, psychology, psychiatry, political science, education, economics, ethics and history. "Problems of values," Robin Williams writes, "appear in all fields of the social sciences and value elements are potentially important as variables to be analyzed in all major areas of investigation (Williams, 1968, p. 286). In each of the areas, however, the concept of value receives a different emphasis. For example, the specialist in ethics is concerned with the meaning of the word "good." The psychologist's interest is in the laws of learning as they speak

to the growth of habits and behavior of an individual. The sociologist and the anthropologist may study value from the standpoint of discovering and analyzing the aims, ideals, and habits of various religious, cultural, national and economic groups. Traditionally, educators are interested in fostering aims and ideals and creating for the future generation a system of attitudes and values.

The findings and interests of these areas of inquiry need to be coordinated and harmonized into a general theory of value for guidance in the decision-making process in an educational system. Educators cannot wisely discharge their responsibilities if they attempt to deal with major issues in a piecemeal fashion. But without any broad frame of reference there is no alternative. What is required is therefore a comprehensive value theory.

The problem of axiology (science of values) is to clarify the criteria or principles by which we determine what is good in human conduct and action, what is beautiful in art, and what is right in social action and the institutions which foster them. The problem of axiology for education is then to clarify the meaning of value and all related terms, examine and integrate them as they apply to the people who are to be served by educational institutions. The complex nature of value phenomena demands an interdisciplinary approach to the formulation of a theory of

value if it is to be comprehensive. If it is to be efficacious it should not only be well grounded in psychology, sociology and anthropology, but must find its roots in epistemological, ontological and axiological foundations of human knowledge. A theory of value grounded in but one area of study concerned with man is vulnerable; contributions from all are required.

The importance of researching the contributions of the many areas of value inquiry in spite of their varied interests and methodologies is not denied but what is questioned is the adequacy of any one area of inquiry in formulating a comprehensive value theory. The following chapter will be devoted to reviewing some of the contributions of social scientists which may assume salience in formulating the value theory of the ANISA Model.

CHAPTER III

VALUE THEORY AND THE SOCIAL SCIENCES

The social sciences, Robert Redfield observes, "occupy uneasy seats at the feast of learning between the physical and biological sciences on their right and the humanities on the left" (Redfield, 1962). The uneasiness, in large part, is traceable to one of their primary concerns - values. While a physicist or a chemist does not have to worry about what his "vector" or "DNA" wants, thinks and believes, it is impossible for a sociologist or anthropologist to investigate any social phenomena without considering the nature of the values of a society or culture. A psychologist is confronted with the same problem when he studies individual personalities. Out of sheer necessity, the empirical study of value phenomena has advanced much further in the social sciences than in other disciplines.

Culture, society and the individual human personality are major antecedents of values. Parsons has analyzed human action to be a system that contains three mutually irreducible subsystems, vis. the personality system, the social system and the cultural system (Parsons, 1951). As Morris recognizes, values play an important role in the origin, maintenance and nature of these subsystems and hence in human behavior as a whole (Morris, 1964). Thus value can be seen as the integrator of the personality,

social and cultural systems, and therefore, the integrator of the human action system.

Social Psychologists and Value Theory

Needless to say, the foundations of a comprehensive value theory that will have relevance for education as an applied science, should be consistent with the psychological theory of human behavior in general and the findings concerning the dynamics of group interaction in particular. There is growing recognition today among social scientists that an adequate theory of values and morality will ultimately rest on the conclusions of developmental social psychology and psychotherapy.

Determinants of human behavior. The starting point from which many contemporary social and behavioral scientists begin a psychological study of man's growth and development, individually and collectively as a member of a society, is the value attributes of his behavior and experience that differentiates him from any other creatures. For them all values are rooted in human behaviors. There are many determinants of human behavior and the viability of theories advanced in this field depend upon the nature of the set of assumptions about these determinants and their relationships. For instance, the classical "Field Theory" of Lewin in social psychology uses the term "vector" for the forces which bear upon an individual as he makes a decision

and acts. To understand value, the determinants of human behavior, which are a part of an individual's psychic make-up and the environmental milieu (both social and cultural), have to be identified and their influence on the resulting behavior under a given circumstance thoroughly studied.

A determinant of behavior refers to an influence exerted upon the person, predisposing him to act or behave in a specified manner in response to a given situation. Scholars in the field have identified (or have tentatively agreed upon) at least three basic determinants involved; viz., belief, attitude (Jacobs and Flink, 1962).

A study that provides a simple and clear understanding of the nexus between value and the above mentioned basic determinants of human behavior is that of Milton Rokeach (Rokeach, 1968, 1973). Rokeach's identification and definitions of the determinants of behavior and their interrelationships are not only congruent with those of Brewster Smith (1963) and Robin Williams (1968) but are also parallel to the general framework for a unified social theory outlined in the classical treatise of Parsons and Shils (1951) and the monumental decade-long work of Kluckhohn and his collaborators (1961), thus bringing a cross disciplinary validation of some significance to Rokeach's work.

Rokeach's Theory of Value

While empirically oriented, social psychologists over the past few decades have been paying more attention to the theoretical aspects of attitude and attitude measurements. Rokeach, realizing the ripeness of the time to shift social psychology's concern, put forward a theory of value which brings about some conceptual clarity in our understanding of values and attitudes and their functional interconnections. His work also includes substantial empirical investigations to show that enduring changes in important attitude and value systems are possible as a result of certain educational procedures, other than persuasion or indoctrination (Rokeach, 1971).

He identifies three basic determinants in human behavior: viz., beliefs, attitudes, and value; and his theory throws some light on how values are formed.

Beliefs: Every conscious human being has a certain basic way of perceiving things for himself, i.e., to make some sense out of the physical and social world in terms of its structure and operation. These perceptions and personal inferences (which may be true or false, objective or subjective, conscious or unconscious) constitute the basis of a belief. Every person has thousands of beliefs about the world around him, and these beliefs are among the basic determinants of behavior. A belief

system represents the total universe of a person's beliefs about the physical world, social world and the self (Rokeach, 1960).

Attitudes: Personal beliefs are often very transient. As an individual grows, they become modified; but at any one time, a relatively stable cluster of beliefs or an enduring organization of beliefs are formed around an object, event, or an idea which predisposes the individual to behave in some manner. Like nucleotides¹ in a biological system, the beliefs become organized into a well-defined pattern or a system having definite observable behavioral consequences. These relatively enduring clusters of beliefs are called ATTITUDES and become hierarchically important behavioral determinants -- important because they are stabler than the basic determinant belief or belief system. According to Rokeach, attitudes, which can be learned, have definite cognitive and affective components which reinforce each other. Besides they also have an evaluative component. An attitude is an integrated belief system but not all beliefs are differentiated aspects of an attitude. For instance, when an attitude is formed

1. Nucleotides are the basic biochemical building blocks of the nucleic acid molecule, like RNA and DNA of the biological system.

about an entity, not all the beliefs about that entity take part in forming the relatively durable structure. For Rokeach, since an attitude has an evaluative component, it leads to a preferential response or behavior. A person, he says, "is predisposed selectively to perceive, recognize, judge, interpret, feel, learn, recall, or think in ways congruent with his attitude" (Rokeach, 1968, p. 122). Or, in other words, attitudes mediate purposive behavior.

Values: Clusters of integrated attitudes form values; they are the main determinants of behavior in any situation. Values elicit two types of results; preferable types of behavior and preferable types of terminal goals. When we say that a person has a "value," it is to say that he has a pattern of relatively enduring clusters of beliefs (attitudes) which says to him that a particular type of behavior or a particular goal is preferable to alternative ways and goals. Value for Rokeach is a more dynamic concept which has strong volitional components as well as affective and cognitive components.

Boiling all these down to a succinct theoretical statement, Rokeach writes, "values are guides and determinants of social attitudes and ideologies on the one hand and of social behavior on the other (Rokeach, 1973, p. 24).

Value System: Once a value has been internalized, it becomes a conscious or unconscious criterion for guiding action and for evaluating the actions of one's own self or

the actions of others. Rokeach observes (1968, p. 160) that this definition of belief, attitude, value -- the trinity of human behavioral determinants is completely compatible with the one advanced by others like Kluckhohn, Smith and Williams. The distinction made between preferable modes of behavior and final goals of actions classifies values as instrumental and terminal respectively.

A person's value system is defined as a learned or acquired organization of rules (basic values) for making choices and for resolving conflicts between modes of behavior and goals of actions. People are often confronted with a problem or conflict situation which they cannot resolve because they cannot behave in a manner congruent with all their values. One value may be pitted against another. They may have to decide whether the mode of behavior or the goal of their actions is preferable and this depends upon the contending rules of the hierarchy forming the clusters of their values that make up their value system. A person's total hierarchy of values is, then, called a value system. A person's total value system may contain thousands of beliefs, hundreds of attitudes, a few dozen values. It follows from this that any change in one part of the system, if prolonged, will change the parts connected to it thus leading to a behavioral change or a goal shift. Attitudes and values, whether instrumental or terminal, are always cognitively and affectively

interrelated. When the value system is internally consistent, it will be the chief determinant of a person's behavior and goal in life. The total personality of a person thus depends upon how his value system is consistent and close to reality. The theory has ramifications for incorporation into the comprehensive value theory of the ANISA Model, which will be discussed in a later section.

Cultural Anthropologists and Value Inquiry

Values pervade the culture of every society in the sense that the conduct of any individual in the culture is always subject to the value system of society. Any attempt to define behavior and education without reference to cultural contexts becomes meaningless. Every society strives to make its newborn behave according to the society's "norms." The process of enculturation (transmission of knowledge, values, beliefs, attitudes, habits, laws and customs acquired by man as a member of that society) is supported by specialized agencies and institutions of the society; the school is probably one of the most influential agencies outside the home and family. Throughout the ages, the first and foremost task of education has been that of transmitting, expanding and in some cases refining the great values in each culture. Occasionally every culture becomes conscious of itself and questions critically its own weaknesses and strengths. In a given culture there

may be many schools of thought each based on a different perspective on the process of "enculturation." These perspectives have one distinguishing common feature; they agree that "culture is the fulcrum of an effort to interpret the meaning of man, his existence and his actions" (Brameld, 1971). But since each culture has its own value system, the outcome of the effort will be different in each case.

Value Systems and Cultural Universals. The contributions of cultural anthropologists may be of great relevance to value theory for anthropologists have always been interested in questions concerning values: Can any value system be considered as universal, if not basically absolute? Are all values inherently relative and is it futile to search for pan-human relations and values? Have we any reason to assume that the values that have emerged out of any given culture have any objectivity superior to those which have emerged from another? Is there any possibility of transcending the ethnocentric predicament in the making of value judgments? Can there be culture-free cues and evaluation? (Kluckhohn, 1953.)

Anthropologists, according to Linton, have consistently avoided judgments regarding what things are universally desired or valued in the final analysis. Their principal contribution to date has been the development of the concept of cultural relativity. Through cross-cultural

studies, they have been able to demonstrate that different societies have successfully achieved the same ends by employing different means, and all of them prize and desire certain values and are willing to work together to achieve them. "In broad general terms," says Linton, "a value can be defined as something that has the capacity to influence an individual's decisions in choice situations or going one step further back, anything capable of producing an emotional response" (Linton, 1954). Under this there are, of course, individual values as well as those which are cultural, i.e., shared and transmitted by the members of a particular society. However, in a search for universals, the individual values may be ignored. They are transitory like the persons who have them and may have influence on the socio-cultural continuum only when they come to be shared by other individuals. In all cultures there are events, objects, and concepts toward which members of the society have strong attitudes. In certain cases, members of a society will work as hard to avoid certain things as they will to win other things. Generally, in anthropological studies, the single term "value" is substituted for a more precise term, "value-attitude system." Within the definition of this term a value may be regarded as anything toward which the members of a society normally have a definite attitude, whether favorable or unfavorable.

Values are an integral part of any society's culture

and with regard to their historical origin, transmission and integration, they follow the same rules as any other element of culture. A normal society consists of a well-organized, self-perpetuating group of individuals which persists far beyond the life-span of any one of its component members. Its persistence is made possible by the presence of a culture, i.e., an organized body of ideas and behavior patterns which are transmitted from generation to generation within the society by learning. The culture as a whole provides techniques by which the members of the society can both satisfy their individual needs while cooperating toward the achievement of common ends.

All societies and cultures are constantly in a state of flux and internal readjustment. Individuals develop new solutions to old problems, new patterns of thought and behavior emerge as a result of progressive leaps into novel and creative ways of dealing with the changing environment. These changes may produce disharmonies in the culture which will create tensions and pressures on the individual who must find new ways to adjust. In this situation of constant flux, the society's main guide in facing new situations and in deciding which of the new patterns of thought and behavior should be accepted and integrated into the culture is the society's system of values. At the same time it is this system that also guides the member's course of action in any new situation amongst possible alternatives

which are always presented at a given time. In both cultures and individuals, there is always some divergence between personal values and value systems of the culture; the degree of divergence may usually be taken as an index of a person's psychological or social stability.

Cultural and social anthropology is to the community, what psychology is to the individual. Anthropologists are concerned with the dispassionate analysis and observation aimed at discovering the deeply rooted subconscious motives that determine collective behavior patterns of integrated societies. Psychologists find that there is a universal need for social dependency in which the interactive person finds the meaning for his life in his relations with others. Just as the psychologically dependent infant would die, the socially dependent adult falls into apathy which may lead into psychological death. Eric Fromm, coming from another discipline, has put it,

Unless the person feels that he belongs somewhere, unless his life has some meaning and direction, he would feel like a particle of dust and be overcome by his individual insignificance. He would not be able to relate himself to any system which would have meaning and direction to his life, he would be filled with doubt and his doubt eventually would paralyze his ability to act or to live (Fromm, 1941, p. 21-22).

It may be a fitting conclusion to end this section with a relevant observation by Kluckhohn:

One of the broadest and surest generalizations that anthropology can make about human beings is that no society is healthy or creative or strong unless the society has a set of common values which give it meaning and purpose to group life, which can be symbolically expressed, which fit with the situation of the time as well as being linked to the historic past which does not outrage men's reason and which at the same time appeals to their emotions (Kluckhohn, 1952a, p. 112).

C H A P T E R I V
TOWARD A SCIENCE OF VALUE

Philosophers throughout the ages have attempted to discover a common core in value phenomena by deriving values from the essential structure of being. This ontological approach to formulate a science of value with the purpose of generating a unified concept of value based on a generic sense of the term is often referred to as 'axiology.'¹

Hartman's Axiology

Robert Hartman's contributions in the realm of value inquiry and value judgments take us in an entirely different direction. The "Science of Value" elaborated by him may provide the key to future realms of knowledge needed to tackle many controversial issues in the study of values. Robert Hartman's axiology as Weisskopf contends "comes very near to the derivation of values from the essence of things" (1959, p. 217). Rather than attempting to fully expound his decade-long contribution to axiology, I shall briefly enumerate the key concepts of his axiology that are the prerequisites for an in-depth understanding of his system, the educational implications of which have yet to be explored.

1. Nicholai Hartman (1932) of the Austro-German school, Wilbur Urban (1941) of the United States and George Moore (1903) of England can be regarded as the founding fathers of modern axiology.

Hartman's contributions lie in his attempt to build the foundation of a systematic theory of value and in leading his readers to some orderly thinking about the realm of value. For him, axiology is to ethics, aesthetics, economics, sociology, anthropology, education and politics, what mathematics is to chemistry, physics, biology and other natural and applied sciences. Axiology is a framework for explicating the value phenomenon. Like mathematics, it has its own axioms, definitions, rules of reduction; its own dimensions, parameters, and scale of measurements.

In all his publications, Hartman shows a close parallel between mathematics and his axiology, even as to their recent origins. Just as Newton's Principia Mathematica was the beginning and basis for all modern sciences, in the estimation of Hartman, Moore's Principia Ethica may be the "mother book" of axiology. The crux in understanding Hartman's thesis lies in having a very clear notion of Moore's idea of "Good." To give a brief historical perspective, Hartman's starting point was the logical analysis of the following sentence from Moore's book: "Good is good and that's the end of the matter" (Moore, 1903). It seems that Moore could not define his own term and he evaded defining it in his book, just as physicists found it impossible to measure the vector of a sub-atomic particle but still went on building theories of atomic and particle physics. It

was not until 40 years later that Moore formulated the two following propositions, elaborating on his previous work.

1. "Goodness is not a natural property of anything."
2. "...though this is so it depends entirely² on³ the natural properties of that which has it."³

But again, Moore could not spell out in which way "it depends." Hartman's "formal axiology" begins from this state of Moore's bewilderment and "sets in and defines exactly the nature of this depending" (Hartman, 1959).

The fundamental axiom of value science. Hartman's clarification of the meaning of Moore's two propositions was the critical step in developing his axiology. He reformulated them in the following way, thus throwing light on the nature of the "depending."

- (a) Goodness is a property not of objects basically, but of concepts.
- (b) An object's goodness depends upon whether it is what or as it is supposed to be.

Equating "goodness" with "value" in the above propositions, one obtains what is called the "fundamental axiom"

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2. Emphasis mine.
 3. "It" meaning goodness.

in Hartman's axiology, or his definition of the idea of value.

At this stage an example is needed to explain this axiom from which flows theorems and corollaries of Hartman's axiology. Let us examine the following propositions.

- A. The University of Massachusetts is good if it is what it is supposed to be.
- B. The University of Massachusetts is good if it is as it is supposed to be.

Extrinsic goodness. The statement "A" describes functionally the attributes of UMass., i.e., it is good because it has functionally all the attributes of a university -- an educational institution which is providing facilities for promoting education. Or, in other words, it has all the attributes or concepts of the class -- university, to which it belongs. This goodness by virtue of its belonging to a class and fulfilling all the attributes of the class is extensional goodness, also called EXTRINSIC GOODNESS, inasmuch as it refers to a relation between the qualities of UMass. and the qualifications of a university. It is evident that the relation between a member of a class and the class to which it belongs is the commonness of their attributes. By putting "what it is supposed to be" in statement "A" we are actually asking to what class UMass. is supposed to belong, given the attributes.

UMass. becomes a good university if it has all the

attributes of universities. It follows, then, that "anything is good or valuable if it has all the attributes or concepts of the class it belongs to;" or in other words, a thing is good when it fulfills the definition of its concept. This goodness as we see is not ethical goodness but axiological goodness, as Hartman puts it.

Intrinsic goodness. When we come to the statement "B" which is that "UMass. is good if it is as it is supposed to be," the goodness here refers not with respect to having all the attributes of a class but as UMass. itself is supposed to be, i.e., its goodness depends upon, not only its membership in the Class of University, but on itself -- on its being as it was intended to be in the first place when it was established. The intention refers to its own particular criteria for being a good university, e.g., its aims and the quality of education it desired to provide. This kind of goodness is called intentional goodness or INTRINSIC GOODNESS. This goodness has uniqueness because no other university can be exactly like UMass. under this condition. Thus, Hartman defines two kinds of goodness or values in his axiology.

While elaborating on the importance of this axiom of axiology, he once again shows the parallel between axiology and mathematics. The key to understanding the science of value lies in the recognition of the fact that

the value of anything applies only to concepts or attributes of the objects and not to the objects themselves (Hartman, 1967).

Implications of Hartman's axiom. There are a number of important implications issuing from Hartman's axiom:

1. The axiom itself throws light on a multitude of problems which have plagued value theory for 2,000 years, such as:
 - (a) the relationship between fact and value;
 - (b) the absoluteness or relativity of value;
 - (c) the objectivity and subjectivity of value;
 - (d) the nature of goodness and badness of the world (Hartman, 1959).
2. The axiom deals with dimensions of value which have a certain hierarchy. Any entity can be valued in three dimensions called systemic value, extrinsic value and intrinsic value according to the degree it fulfills the definition of its concept and depending upon the frame of reference; e.g., we love mankind systemically, our next door neighbor extrinsically, and our life partners intrinsically. Usually, values grow from systemic to extrinsic to intrinsic.
3. The relationship between the actual and the ideal in any entity is also explained by the axiom. When the axiom is applied to an individual, it explains his structure. A person is systemically good (or valuable) because of his being a part of mankind, his species, and having all the

attributes and contributing to the collective life of mankind. He is extrinsically good when he fulfills the expectations as a member of a particular class -- a teacher, administrator, doctor or farmer. A person is intrinsically good as a doctor when he is as good as his conscience as a doctor demands. Or, in other words, a person is good if he follows his conscience to become what he himself has set to become, i.e., when he attempts to fulfill his subjective aim or purpose in life. Thus conscience is an intrinsic value.⁴

One of the educational implications of Hartman's propositions is that a "sense of values" depends on knowing the attributes that define a particular class and on knowing how something is "supposed to be" -- i.e., standards of excellence and quality, etc.

4. This raises another point. According to Hartman's value theory, a master thief is a good thief if he steals well and is a perfectionist. In terms of his own aim, though it may be detrimental to the collective security of the population around him, the thief is "good" axiologically.

C H A P T E R V

TOWARD A COMPREHENSIVE THEORY OF VALUE

From the point of view of educational practice, the present status of value theory is analogous to that of the theory of knowledge or learning at the beginning of this century. Each discipline has made its own contribution without any preconceived plan or pattern of inquiry as to which aspect of value it should investigate, and yet these studies show the many important dimensions of value. To demonstrate how they all seem to fall into place will be the task of a comprehensive value theory.

Perspectives From Current Theories

There is a relative ubiquity of the value-attitude concept across disciplines. Attitudes seem to be the special concern of psychologists and sociologists while values and value systems have long been a central attraction to social or cultural anthropologists. These disciplines share a common concern with the antecedents and consequences of value organization. None of the theories discussed here touches directly on the relevance or application to educational theory or practice though they are implied in each of them.

Sociology was defined by Max Weber as "that science which aims at the interpretive understanding of social behavior in order to gain an explanation of its causes,

its source and its effects" (Weber, 1962). Identifying value as the chief determinant of social behavior of an individual in actual life situations, the social psychologist, Milton Rokeach, provides a reasonably clear notion of his model -- a person-centered theory, outlining the mechanisms involved in the formation of values and organization of an individual's value system. Values determine behavior and Rokeach (1973, p. 211, 338) holds that value change leads to attitudinal and behavior modification. Values are implicated as dependent or independent variables at virtually all levels of social function -- cultural, institutional, group and individual. Since the life process depends on the selection or rejection of certain aspects of the environment, the preferential behavior -- the positive or negative orientation toward an object, idea or event -- is a basic phenomenon of life. For Rokeach, true to the tradition of a social psychologist, the study of preferential behavior constitutes the science of value.

This view may lead one to infer that Rokeach's theoretical persuasion is not far removed from that of B. F. Skinner who views values in a different light when compared to social psychologists.¹ For Rokeach value is a

1. In Beyond Freedom and Dignity, Skinner argues "that the reinforcing effects of things are the province of behavioral science, which, to the extent it is concerned with operant reinforcement, is a science of values"(Skinner, 1971, p. 104). Skinner concedes value to be at the most a by-product.

more dynamic concept and has a strong motivational component as well as cognitive, affective behavioral components. Values that are internalized as a result of cultural, societal and personal experience are more or less psychological structures that in turn have consequences of their own. Values, as Rokeach rightly comments, serve a "self-actualizing function" (Rokeach, 1973, p. 25). They also represent what has been actualized.

A value theory like that of Rokeach (which considers values as determinants of behavior and explains the change and the mode of change of behavioral determinants) has yet to account for the much needed vital relationship between its position on development of the person's "value system" and the "value system" of the theory of cultural dynamics as it is emerging from contemporary anthropological research.

Anthropologists have shown the importance of a value system for a culture or a society's stability and viability. But all cultures do not appear equally stable and therefore to hold that values, value systems, and value judgments of all societies are equally valid and relative to the society in which such judgments are made is a rather naive and weak theoretical position. The proof of this lies in the fact that in important matters, men do not act on this theory. They always look for an objective basis for value. While the concept of cultural relativism frees the mind of the observer from errors of ethnocentric biases, it makes, as

Fried observes, exceptionally difficult, perhaps even impossible, the task of scientifically analyzing and comparing cultures and their values systems (Fried, 1964, p. 164).

Value systems and value judgments, as Benedict concludes, are expressions of the total pattern of culture (Benedict, 1934). Members of different societies start from different premises for validating their judgments, and therefore, there is no basis for argument that does not beg the question. It is in this area, anthropologists find, that disagreement seems most frequent and often irremedial (Wellman, 1963). Since there are no universally accepted premises, no universal validity is possible. A theory which holds that all values are relative is a protective one, in fact, even a permissive one. It only justifies our resistance to aggressive people who insist on their own value scheme as final. But it does not enable us to combine forces and rally men to take a firm stand against injustice, cruelty, exploitation, prejudice, or any other undesirable state of affairs. This position was probably tenable when societies and cultures were isolated and ethical standards of one culture in no way affected detrimentally the way of life of the other cultures. This is untenable in this era where ecologists have realized the wisdom in the old Vedic² saying "Even the dropping of a dry leaf from a tree has its own effect on the universe."

2. Vedas are the sacred scriptures of the Hindus.

As Hocking remarks (probably dogmatically):

It is part of the strange shallowness of recent western life that it should be deemed a conceit to recognize an absolute, and a humility to consider all standards relative, where as it is precisely the reverse: it is only the absolute that duly rebukes our pride (Hocking, 1959, p. 166).

No sound axiological theory can develop on the basis of current assumptions of anthropology and sociology in respect of the relativism of values in different societies and cultures, unless there is a sound basis for validating the value system at another level of human reality.

Hartman has given us a logical (axiological) definition of value and a reasonable concept of conscience, but his system needs an exogenous reference system on the basis of which his term "as it is supposed to be" can be given true meaning. No doubt his system appreciates the need for realizing the expositional properties or purpose of an entity (a concept not so popular until recently in the world of behavioral scientists), but again one can go on endlessly disputing what "as it is supposed to be" is. In this regard Hartman's attempt "stumbles on the lack of a theoretical stance" from which one can select the relevant sets of properties intrinsic to the entity (Welty, 1970). As explained earlier, according to Hartman's value theory, a master thief is a good thief for he steals well and is a perfectionist in his technique. In terms of his own aim, though it may be detrimental to the collective security of the society around him, the thief is "good" axiologically.

To brand this robber as a moral degenerate, one would need an external standard as a reference point which will articulate the individual's true purpose and goal in life. It is natural that any axiological judgment would differ from person to person because of one's ignorance or non-acceptance of the purpose of an entity (or the expositional properties of the thing) under consideration. This serious deficiency of Hartman's axiology is alluded to by Robert Mueller in his criticism of Hartman:

Hartman's system is neat, clean and mathematically and logically unassailable as long as it remains in its tower. But the consequences of its descent into the real world are disastrous.... But this is not to say that Hartman's work could not be used in conjunction with other systems to form some sort of value study or test. In particular, since the test depends for its validity on the system's ability to determine value in things themselves (expositional properties of things)³ and since in the present system, this ability is lacking, some other criterion would have to be invoked; but once invoked, there is no apparent reason why a real system and test might not develop (Mueller, 1969).

Emergence of Values in the Process of Man's Becoming

The ANISA theory of development which explains the nature of man's becoming as the processes of actualizing his innate potential, identifies five basic categories of psychological potentialities. When these potentialities⁴ are

3. Parenthetical phrase is mine.

4. Potentiality comes from a Latin word and connotes "latent power."

actualized through the interaction with the environment, they become power or energy ("effectance" to use Robert White's term [1959]) to the becoming man which enables him to interact further to increase his effectance. Like all forms of energy, which are available only in quanta, the actualized potentialities form enduring quanta, or aggregates, or structures which predisposes the interacting organism to respond in a specified way to some aspect of an environment.

The actualized potentialities are not random expressions of energy utilization. The expressions are patterned; these patterns, when they are relatively enduring, are called value in the ANISA theory. Presumably these patterns are the result of (functioning) structures which are formulated (in the brain) as a consequence of interaction with the environment. The formulation of these structures is what is meant by the term learning; learning competence means developing structures which enable one to understand what to do to establish other structures that are wanted as efficiently as possible. Thus learning competence is the fundamental expression of transcendence.

Actualization of potentialities does not take place in a vacuum and interaction with all aspects of the environment -- micro to the macrocosmic -- are inextricably involved in the process. Thus value formation is the structuring of potentialities from all categories, viz., psycho-motor,

perceptual, cognitive, affective and volitional, fused with information about the environment. Since the fusion includes volitional elements, values always have an evaluative or decision-making constituent which has implications for increasing effectance. Thus the emergence of values is the process of becoming. Values predispose the organism to respond or behave in a certain way in relationship to some aspect of the environment usually in terms of a purpose, and as Rokeach observes, guides human action and is a determinant in behavior. Values are indispensable outcomes of the process of becoming; they are reflected in all thoughts, relations and activities no matter what man thinks or believes or how he responds to his fellow men, society, himself and the cosmos. They are either subjective, laden with feelings, or objective and rational. They are embodied in all man's interpersonal relations, goals, and behavior. A value system is composed of all the values usually integrated around aims, purposes or ultimate concerns.

The patterns in the use of the energy available to the organism as a result of structuring of the 'actualized potential' and the ends to which the energy is used by an individual defines the self and constitutes the structure of personality or identity (Kalinowski and Jordan, 1973).

A considerable number of clinical findings which reveal the principles of normalcy, growth and maturation of psychologically healthy individuals and evolution of their value

structures have been gathered and coordinated by several psychologists such as Maslow (1962) and Fromm (1955). Shoeben gives the following criteria for normalcy: "Self-control, personal responsibility, social responsibility, democratic social interest and ideals" (Shoeben, 1957). Concepts of "adjustment," "integration," "mental health or happiness" and "self-actualization" in clinical psychology can become relevant only in a unified frame of reference pertinent to patterns of structuring of energy and its use as articulated by ANISA's value theory. Maslow has made this abundantly clear by stating that the right sort of psychotherapy is relevant to the search for values. He observes:

I think it is possible that we may soon even define therapy as a search for values, because ultimately the search for identity is, in essence, the search for one's own intrinsic values (Maslow, 1962, p. 166).

Problems of personality maladjustment, growth and development cannot be adequately interpreted except in terms of a coherent and orderly use of the energy as the actualized potential of man is structured.

The identity of man -- the patterns of his use of the quanta of energy -- depends to a large extent upon the society in which he has been brought up. How values -- structured 'actualized potential' -- differ according to the cultural and social milieu of the growing human being can be easily visualized when one ponders the effect of

enculturation seen in such diverse types as the English aristocrat, the Australian Bushman, the Hollywood 'model,' and the Indian Yogi, all of which leaves one wondering if there is anything basic or universal underlying the formation of values. Personality is primarily a social product and since societies are in a state of flux, there is a continual reconfiguration in the value system (i.e., restructuring of the actualized potential) from early childhood to old age, depending on the quality of the interaction between the individual and the environment. There is, moreover, a reciprocal relationship, a relation of mutual reinforcement between the two -- the personality of the individual and the structure of the social environment. No arbitrary change in the individual's value system will suddenly alter the personalities in the social system as a whole in a desired direction.

Determinants in Structuring of Actualized Potentiality

There are many factors that guide or influence the dynamics of structuring of the use of energy as human potentialities are actualized. It would be the role of a comprehensive value theory to identify and speculate on the nature of the forces which will either be confirmed or disproved on the basis of further empirical evidence. While it would be virtually impossible to study these factors in any absolute way, one important factor which has been empirically

validated is the nature of the information about the environment which the person has. This is a pre-eminent force since, information about the environment (the physical, human or unknown) is always fused with the process of actualization to form values. This information about the environment comes in the form of organized and classified knowledge of man's accumulated past (immanence of the culture) present and future. While the actualization of the potentialities in man cannot be understood apart from his inner pressure and propensity to become, the structuring of the actualized potentials form values and is guided in the ultimate analysis, by the subjective aims, purposes, or "lure" from the environment.⁵ These aims and purposes, either of the developing individual, or of the society, or both, in turn become the determinants of human behavior. The behavioral and social sciences define these as preferences, needs and goals.⁶ The disciplines in humanities define them as "oughts." With proper use of energy (values) man can delay his satisfactions,

5. Patterned expressions of these aims and purposes can be termed as ideals.

6. The "ideational, idealistic and sensate values" of Sorokin (1941) refer to the quality of the lure that guide the structuring of the actualized potential of the society as a whole, while Maslow's (1959) "hierarchy of values" in his theory of motivation and personality refer to the needs, aims, and purposes that structure the energy of the individual.

fix his mind and behavior to distant and unrealized goals, strivings and ideals. Thus a value-ideal relationship is rather reciprocal, one reinforcing the other. Any prioritization of needs, aims, and purposes consequently gives rise to a hierarchy in value and value systems and will be reflected in corresponding changes in behavior.

Validation of Aims and Purposes

Values and value systems are viable only to the extent that the needs, aims and purposes that serve as lure for the structuring of the actualized potential, are objectively validated. Needless to emphasize that the efficacy and coherence of a comprehensive theory of value, irrespective of the discipline that formulates it, hinges on this criteria of objective validation, as has already been shown in the case of Hartman's axiology and the value inquiry of cultural anthropologists. One must appeal to some basis of objective validity or argue in a circle.

The various behavioral sciences have performed a valuable service in describing the factors and conditions that shape human behavior. Even if the social sciences discover in detail the various patterns of behavior which reflect certain values derived from specific aims and purposes, it does not necessarily mean that these values ought to be the ethically right ones toward which human behavior is aimed. As Margenau contends:

Indeed even if we know everything about the physical universe, about human physiology, about man's natural dispositions, his drives, his instincts and his normal reaction to all stimuli; even if we could predict how average man will behave under all specified circumstances at a given time of the evolutionary process, we should still have no basis for judging the moral quality of his actions (Margenau and Oscanyan, 1969).

We have practically no conceptual guidelines within the framework of a value theory in educational practice for assessing the extent to which the determinants of human behavior, e.g., attitude, value, value system, aim, purpose, and consequently human behavior itself, has objective validity. Each mode of behavior may be judged as the correct one on its own right. Even if we contend that the ethical or axiological correctness of a behavior or the appropriateness of an aim or purpose (chosen to be the lure for structuring the actualized potential) may be judged by the consequences it engenders, then we have to be able to evaluate the worth of the consequences and the objective structure of worth has to come from some other source. Values, along with their antecedents and consequents, should obtain the ultimate validation from some other dimension of human reality. It would be wrong to assume that to desire a particular consequence is itself wrong, for what is worthy and what is desired, may often coincide. The essential idea is that distinction must be made between values structured by lures that happen to be mere interests, needs and desires and those based on goals and purposes which

have objective worth based on human realities. There is a decisive difference between wanting something and affirming its worth.

If what is worth or good is defined as what gives satisfaction, pleasure or success, and when we act on that axiom we commit a blunder which Moore called the "naturalistic fallacy" of identifying fact with value. To avoid this blunder, the meaning of desirable and worthy consequences or goals must be interpreted as an IDEAL. It means a state of affairs that is worth bringing into existence and to be devoutly hoped for. An ideal may be defined here as "not an actuality, not a fact, a possibility that ought to be realized, a potentiality it is desirable to actualize" (Phenix, 1964, p. 230).

Objective validity in value inquiry requires an ideal or set of ideals to serve as standards of references, for ideals make absolute demands in both thought and action.

Nexus between ideals and values. Ideals constantly remould the patterns of human values (patterned of expression of energy - the structure of actualized potential). Ideals themselves are constantly rethought and refashioned as they necessarily remake man and society through new value orientations, new appraisal of social roles and moral relations. This demands imagination of the highest order backed by constant readiness for fresh scrutiny and criticism of values.

Such practical use of an ideal as a goad, according to Mitchell (1925), corresponds to the analytical method in logic and mathematics. An ideal is a mental construct embodying a situation which, if actualized, would mean the solution of the problem. Just as a hypothesis is a mental construct in which facts find their explanation, the ideal is a mental construct in which subjective aims, needs, and purposes find their fulfillment. Ideals integrate elements of values at various dimensions and are the life and substance of the healthy individual. As Bonner puts it:

"Without ideals man is not fully human, for the essence of humanness is the capacity to envision and actualize ideal ends." (Bonner, 1965, p. 7.)

As Mukherjee writes:

"The ideal is a gestalt, a holistic entity, It cuts across the biological, the social and the metaphysical dimensions of human living and reconciles and integrates the polarities and contradictions involved there in. As it creates new values and coordinates and transforms new values in a new dimensional setting and through a new dialectic, it refines and reframes a new situation, carrying with it deeper ego-involvement, higher moral commitment and fresher intellectual outlook. (Mukherjee, 1964, p. 93.)

Ideals as working hypothesis in value theory. Many moral philosophers have tried to develop a system of objective validity in questions of ethics from simple postulates concerning human goals and ideals. The telling characteristic of all such endeavor says Margenau is that "by themselves they remain ineffective" and goes on to add:

A living ethical system has never come out of any proposition which merely records that man's goal is happiness. That knowledge is simply not sufficient to guide man's action in specific circumstances. But if a principle claiming that happiness is man's desirable goal were used as a criterion of validity for the actually occurring patterns of behavior, the ethical enterprise could be satisfactorily completed. The empirical facts of actual behavior could then be compared with the ideal protocol behavior defined by the principle of happiness...the scientific process is successful when the particular inferences of a system agree with protocol experiences. The ethical process is successful when actual behavior agrees with ideal protocol behavior. In the former case, scientific theory is verified; in the later, ethical norms are validated (Margenau, 1969, p. 169).

The importance of using desired goals and ideals as objective standards for validation of values is emphasized also by Mukherjee:

It will be of immense advantage for social science to envisage carefully defined and controlled goals, standards and ideals, and then reach back from the complete ideal to the necessary social conditions and the intermediate means. The way will then be prepared for bringing into existence the necessary social conditions and to furnish the means for the realization of the ideal by desirable changes.... Ideals, accordingly, are the working hypotheses of the social sciences, frames of reference, that guide and regulate goals and behavior as integral parts of a universal and unlimited frame (Mukherjee, 1964, p. 94).

There may be doubts if we can ever validate in any objective way (by use of methods similar to the natural sciences) the significance and goals of human action and ideals which appear to be so intensively personal. However, current

rethinking in the methods of scientific inquiry⁷ allows for a new paradigm for scientific inquiry, more liberal than ever before, in that it allows the inquiry "to harbor certain ideals, non-empirical concerns regarding its product" (Margenau, 1969).

The position taken here is that for educational purposes and psychological health of the individual and the societies around the world, we need a new accent on values that transcends human wants and that any value laden enterprise, like education for example, makes sense only when there are, as Phenix succinctly puts it, "objective excellences that invite the loyalties of men and constitute the standard and goals of human endeavor" (Phenix, 1961, p. 5). It is not my intent to claim that we all know what ultimate good is, nor is it that it is possible to have congruency of opinions universally on ethical questions and value judgments. But it is my intent to speculate that any serious concern to find out and act on what is right rests on the convictions derived from transcendent ideals -- objective standards of worth upon which universal

7. There are certain metaphysical requirements which the basic constructs of any field of scientific inquiry must fulfill in order to become genuine elements of a theoretical science; criteria such as internal logical consistency "fertility, simplicity and elegance" in their formulation are as important as the ability to generate empirically verifiable hypothesis (Margenau, 1950, pp. 75-101).

agreement, at least in principle, is possible.

The term ideal is used here in a very broad sense to cover beliefs, values, goals, purposes, and aims, scientific, moral or spiritual. Ideals are real phenomena and are part of man's psycho-social equipment. Before new factual knowledge can become effective, it must be organized, incorporated with or related to an ideal. Ideals grow out of our experiences, as patterns of the way we structure our unknowns in the environment -- physical, human and unknown -- and may differ a great deal in what may be called their scientific or objective validation. Whether validated or not by any method, ideals can still exert strong psycho-social effects: for instance, the ideal of "civil disobedience" of Mahatma Ghandi or Martin Luther King, Jr. But in the long run only those ideals will prevail which are scientifically validated and are backed by well established factual knowledge.

The present study suggests a basis for understanding the nature of ideals from the knowledge accumulated through the studying of evolution of man and that any paradigm for the scientific inquiry in the domain of human values should include the concept of ideals in its postulates. The following chapter will be devoted to the question of how our present-day knowledge of evolution has given us a new concept of man and his destiny, hitherto left untapped for incorporation into a theory of value for educational purposes.

C H A P T E R V I
UNDERSTANDING THE PROCESS OF BECOMING:
ROLE OF BIOLOGICAL SCIENCES

The ancient Chinese realized that man's quest for relevance at all times, no matter how illumined he becomes, will always center around three basic and distinct areas of interest, viz., man versus nature, man versus man, and man versus his own 'self.' The integrated knowledge gained in pursuit of these interests affords the basis for a comprehensive philosophy of man, which in turn then serves as the basis for understanding the process of his becoming.

The spectacular advances in the biological sciences have made significant contributions to our understanding of the nature of man and the meaning of order and disorder as they relate to his growth in his environment. The light thrown on the significance of time in the process of man's becoming is one of the chief contributions of the biological sciences. Everything has a past from which it has emerged and a future toward which it moves, and hence all things -- man and mankind inclusive -- are immersed in a ceaseless process of change in a continuum along a time dimension towards some ultimate goal or in accordance with some ultimate purpose.

Scope of Evolutionary Biology

While all things, animate and inanimate, fall somewhere along the above continuum, the study of living things makes this process of change more observable. It is mainly from the study of living entities that the great idea of evolution sprang -- an idea that appears to be applicable to everything in the universe. Though theories of cosmic and terrestrial evolution have appeared in the VISHNU PURANA of the ancient Hindus, biological evolution has been the subject of intense study of the theoretical biologists over the last century. The advent of Darwin is rooted in our minds to such extent that few can conceive of any other non-historical, non-evolutionary or non-developmental approach to the study of any phenomenon. Pitrim Sorokin admits: The stand point of 'origin, development and evolution' is our mainstay in studying anything from religion to the stock market." Teilard de Chardin affirms that position:

Is evolution a theory, a system, or a hypothesis? It is much more -- it is a general postulate to which all theories, all hypotheses, all systems must henceforward bow and which they must satisfy in order to be thinkable and true. Evolution is a light which illuminates all facts, a trajectory which all lines of thought must follow -- this is what evolution is (Teilard de Chardin, 1965, p. 219).

The term "evolution," which has been given the meaning "sustained change" in biological literature, has been more

recently¹ defined succinctly as

a one-way irreversible process, in time, which during its course generates novelty, diversity and higher levels of organization. It operates in all sectors of the phenomenal universe but has been most fully described and analyzed in the biological sector (Sol Tax, 1960, p. 107).

Evolution, then in the broadest sense of the word, is the name we assign to the comprehensive plan or sequence in all events, ideas and thought. In biology, the idea that is central to the evolution of organisms is that everything is what is by virtue of a process of growth and development involving a long chain of interrelated antecedents.

Theoretical understanding of how the various species of living things came into being and inquiry into the nature of the processes in their temporal development is the theory of evolution.

The original concepts of Charles Darwin, viz., inheritable variations, adaptative and natural selection, have been abundantly confirmed, elaborated and often improved upon by investigation over the past century by the study of fossils (macroevolution) and also by the study of

1. Over fifty of the world's leading experts on evolution worked out this definition during the proceedings of a convention of scientists from all over the world in 1950, sponsored by the University of Chicago to celebrate the one hundredth anniversary of the publication of Darwin's Origin of the Species.

invertebrates -- submicroscopic living organisms like bacteria, viruses or fungi (microevolution). As Dobzhansky observes:

Microevolution and macroevolution are parts of a single continuum and studies of the former help to elucidate the latter. After all, the knowledge about the structure of the atom obtained inside the four walls of a laboratory has helped in understanding the evolution of the stellar systems (Dobzhansky, 1958).

Macroevolution cannot be observed at work; we observe only the end products of its action in our lifetime. However, a phage biochemist or a geneticist can study microevolution in his laboratory in his lifetime.

Today there is a strong consensus that the Darwinian view of evolution can be characterized by the following two postulates:²

- a) that all events that lead to a production of new genotype, such as mutation, recombination and fertilization, are essentially random and not in any way selected, and
- b) that the order in the organic world manifested in the numerous adaptations of organisms to the physical and biotic environment, is due to the ordering effect of natural selection (Mayr, 1962, p. 85).

For a biologist the animal, plant, or micro-organism he is working with is but a link in an evolutionary chain

2. This is sometimes called 20th century Darwinism or a synthetic theory of evolution, so called because it is a new synthesis from all fields of biology and not an offspring of any one of the numerous preceding theories.

of changing forms, none of which has any guarantee of permanence. Hence for him there is hardly any structure or function in an organism that can be fully understood unless it is studied against this background. The study of evolution teaches us certain modesty in our ability to make accurate statements about the nature of man; anything affirmed about his nature should be done with implied understanding and a qualification -- "at this point of his growth and development along the evolutionary line..." With this tentativeness comes an attitude of expectancy concerning new human possibilities that may emerge as evolution proceeds.

As Phenix states:

Biology fosters a view of man as engaged in a continuing adventure drawn on to new levels of fulfillment by the lure of future possibilities. The human future is open rather than closed. Moreover, the evolutionary picture shows that man's beings and becomings are intimately connected. Man is what he has become; and his present being is what it is by virtue of the long struggle for more successful adaptation to the environment. Therefore, the individual becoming of man and the evolutionary becoming of mankind are mutually illuminating -- an insight embodied in the old dictum that "ontogeny recapitulates phylogeny" (Phenix, 1964, p. 31).

Present-day biologists' contributions to our understanding of the nature of man and his own place in the universe, represent a convergence, synthesis and interpretation of all biological disciplines, e.g., genetics, paleontology, embryology. Theoretical biology is concerned with interpreting the logic and methodology of the science of living organisms; since it establishes the foundations of

biological knowledge, it may be said to form a branch of logic and epistemology. Theoretical physics, now a well established discipline, has its own speculations about the nature of the physical universe and this in turn has profound consequences for dealing with problems of general philosophy. Only recently have we been able to notice the relevance of biological topics, such as the mechanisms of evolution or mechanisms of perception, to the branches of philosophy. We can now see the role of theoretical biology in providing a critical, reflective and methodological clarification which will serve as a bulwark against superstition, dogma and fallacy. Albert Schweitzer (1947) once wrote that our age has discovered how to divorce knowledge from thought, with the result that we have indeed a science which is free, but hardly any science left that reflects. Biology is in a position to assume a role of reflection in assisting man in his quest for meaning.

Understanding the mechanisms of man's evolution, biological and cultural, has ethical, ideological and philosophical implications that are far reaching. The main question which evolutionists are concerned with is whether cosmic, human and biological evolution are three unrelated entities, or, are integral parts of a single process of evolution. To be more specific, are biological, mental (psychological) and cultural evolution of the human species stages of a single universal process? In the emergence of

man has the emphasis of evolution been shifted from the biologic and organic to the psychological and the cultural? What light does evolutionary biology throw on the problem of purpose and teleological explanations in biological organisms? Since man is the only known product of evolution that can make a distinction between what is from what ought to be, does the study of his evolution clarify for us the nature of the good at which he should aim? Does it enable us to understand more precisely the meaning of moral judgments concerning what ought and ought not to be done? Is man's ethical judgment, and consequently his behavior, related to his own evolutionary growth? Is there any purpose in human evolution? These, none will deny, become poignant issues of personal and social urgency, too critical to be left ignored.

While dealing with the above issues in depth is beyond the scope of this dissertation, however, summaries of a few of the most impressive contributions which have relevance to a study of these issues will be dealt with in the following pages. These contributions fall into the following categories:

- a) Mechanisms of human evolution in contradiction to pre-human evolution.
- b) Pathways adopted by organisms to maintain their identity at any one point in its evolution amidst constant change in the environment.
- c) Our understanding of the reasons for the biological uniqueness of man.

- d) Speculations about the emergence of new possibilities of patterns and organization for collective evolution of mankind and the vector of the direction of this evolution.

Mechanisms of the Human Evolutionary System

The biological evolutionary system as seen today can be envisaged as a synthesis of the classical theory of evolution by natural selection, an idea which for the first time crystallized the problem of cumulative change in the biological world, and the advances in Mendelian genetics. Contemplative analysis of the idea of "survival of the fittest" which plagued the minds of post Darwinian evolutionists, wedded to the concept of natural selection, led to the understanding that the crucial matter is not survival but hereditary transmission of genes and most important of all the nature of the interactions between the environment and the biological organism in which these genes are carried. To obtain a better picture of the evolutionary mechanism, Waddington proposed a system involving four factors:

A genetic system, which engenders new variation by the process of mutation and transmits it by chromosomal genes; an epigenetic system, which translates the information in the fertilized egg and that which impinges on it from the environment into the characters of the reproducing adult; an exploitive system, by which an animal chooses and modifies the environment to which it will submit itself; and a system of natural selective pressures originating from the environment and operating on the combined result of the other three systems (Waddington, 1960, p. 94).

Socio-Genetic System. While all the above factors of the biological evolutionary system undoubtedly persist in the human situation, an extraordinarily important step characterizes his evolution and this accounts for his unique ability to undergo acculturation, change his mode of thinking, living, etc., without a corresponding genetic change in his biological make up. As Huxley describes it:

In this phase a new mechanism of continuity and change is operating, based not on the self-reproduction and self-variation of matter, but on the self-reproduction and self-variation of mind and its products (Huxley, 1963, p. 8).

It operates by what anthropologists call a cultural system, involving the transmission using elaborate symbol systems of cumulative, organized experience, conceptual knowledge, beliefs, feelings and aspirations of the previous generation made available to the succeeding ones. In effect a new mode of heredity transmission, which Waddington designates as "socio-genetic system," is in operation in human evolution in contradistinction to pre-human evolution. This does not imply that biological evolutionary mechanism found in pre-humans has ceased to operate in man, nor does it mean that genes are irrelevant, and as Dobzhansky puts it:

The genetic equipment of mankind endows it with a capacity of cardinal importance, that to acquire and to transmit from generation to generation the knowledge and the skills to control the environment. Every succeeding generation can, if it so chooses, stand on shoulders of the preceding ones and aspire to ever greater attainments. The emergence of this genetic equipment was the evolutionary masterstroke which placed our species at the summit of the living

world....The autonomy of cultural evolution does not mean that an impenetrable wall separates our culture from our genes. The autonomy of culture means that while genes make it possible they do not determine its contents. Similarly, human genes determine the capacity of speech, but they do not determine what is said (Dobzhansky, 1959, pp. 79,81). (Emphasis mine.)

Evolutionary biology has thus brought to a sharp focus the existence of a non-genetical system of heredity in man and has placed the onus for his evolution on the powers of his brain³ and consciousness and not that of his body (Huxley, 1953). Human advancement, henceforth, does not depend on the Darwinian concept of "survival of the fittest" involving ruthless physical competition in fighting the environment and in fulfilling drives and instincts as seen in the pre-human evolution. The direction of human development as portrayed by Darwin gave no ontologically ingrained purpose either in nature or in whole man as a creature of nature.

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3. One of the greatest neurologists, Herrick, has shown that in the course of the evolutionary development of life, the motor apparatus took the lead. All plants and the most primitive animals function without nervous systems. In the course of the development of man, the motor apparatus took precedence over the other parts (Herrick, 1956).

Huxley's Humanism.⁴ Many thinkers have impressively attempted to exploit this new understanding of human evolution given by evolutionary biology for guidance as to how human affairs should be conducted in the future. Julian Huxley's humanist philosophy as elaborated in several of his writings stems from such an understanding of human evolution (1953, 1963, 1964, 1971).

Evolutionary biology has undoubtedly contributed a great deal to our knowledge about man and his environment and offers a scientific prognosis of man's future. We know now more about man's nature and his potentialities. If man has potentialities to be actualized, then man, in the first place, must have the tremendous potentiality of evolving; he is individually and collectively not an end state but a process. Biological evolution of man has led to a higher order of evolution sometimes referred to as cultural evolution, and very definitively, as Huxley contends, evolution is now passing from a stage determined primarily by the biological process of natural selection to one determined by conscious effort. The cultural evolution

4. The humanist tradition comes to modern man from the ancient world of Greeks, who first developed the conception of life guided by reason and later on during the 18th century provided the core of the modern idea of progress. The humanist tradition developed man's faith in his own reasoning powers -- in his ability to govern himself, solve his own problems and improve his way of life.

of mankind is superimposed on its biological evolution and the stages of the former are non-biological without being contrary to the laws of the latter.

The significance of cultural evolution can hardly be exaggerated. The development of the languages and literatures of the world, of media of mass communication, of science and technology, have altered immeasurably man's mode of existence.

What is of particular significance is man's increased potential for guiding the course of future evolution. He has certainly gained powers, through his understanding of the mechanisms underlying natural phenomena and of the means of predicting and controlling natural events, to make the bearers of certain genotypes more or less successful in survival and reproduction.

The human condition is changing both culturally and biologically. Although the cultural evolution overshadows the biological, the two are connected by feedback relationships; culture has a biological foundation. Natural selection continues to operate in a modern mankind, but its action is supplemented by artificial selection. The problems of the management of human evolution are, however, as much sociological as they are biological. The success of any progress depends on the creation of favorable conditions for human development and self-actualization. Mankind is at a stage of cultural evolution which tests the evolutionary

strategy that led to man. His choices are crucial and agonizing, but he cannot defer them or avoid them. Even the deliberate suppression of rational behavior, as Ravin writes, is a choice and will have evolutionary consequences (Ravin, 1970). What is of particular significance is man's increased potential for guiding the course of human evolution. In fact, as Huxley sees it, it is difficult to imagine how man, given his present powers and the rate of acquiring and transmitting knowledge, can possibly avoid intervening in further evolution. Commenting on the knowledge explosion as a result of socio-genetic transmission since the advent of Darwin, Huxley writes:

Its upshot is clear. Man is not merely the latest dominant type produced by evolution, but its sole active agent on earth. His destiny is to be responsible for the whole future of the evolutionary process on this planet. Whatever he does, he will affect that process. His duty is to try to understand it and the mechanisms of its working, and at the same time direct and steer it in the right direction and along the best possible course.

This is the gist and core of Evolutionary Humanism, the new organization of ideas and potential action now emerging from the Humanist Revolution of thought, and destined, I prophesy with confidence, to become the dominant idea-system of the next and critical phase of psychosocial evolution (Huxley, 1971).

Human evolution then implies the transformation and education of his primitive animal nature in larger and larger measure so that the becoming man shapes further the evolution of his own nature in terms of the ideals, goals, and values he prizes, selects, and nurtures. This means the creation and transmission of ideals that come to

determine the paths of his evolution. In essence, then, human evolution cannot be understood unless values are understood in terms of his yet to be actualized potentialities and evolutionary possibilities.

Social Homeorhesis

What is distinct about living things is not only the fact that they develop but the manner and direction of the development. Organisms are characterized by their ability to preserve constancy in the midst of change. Living matter has the astonishing power of duplicating itself by incorporating materials from the environment according to the pattern of its own being or true identity. Homeostatic mechanisms within each organism keep it alive by enabling it to adjust itself so that the conditions of viability are always met. The capacity of living matter to keep adjusted in this way preserves its identity amidst changes.

This property of constancy amidst change is possible primarily because living things are 'open systems.' According to the second law of thermodynamics the energy transformation in a self-contained or closed physical system takes place in such a way that entropy¹ is increased. That is

1. Entropy refers to a measure of the randomness of energy distribution in a system or the degree of molecular disorder. This measure gives a clue to the amount of unavailable energy in a system toward a useful purpose served by the system.

to say, all energy changes in an isolated mechanical system proceed in a direction of greater disorder. Living organisms by virtue of their being open systems have the ability to maintain themselves against disordering influences.

(Bertalanffy, 1968.)

Living organisms are classified as open systems because they exchange matter and energy with their surroundings in such a way as to perpetuate themselves and develop. A fundamental ontological principle in all living things is then the conservation of an organic order. In the case of humans, the affirmation of existence or, put differently, the will to live, seems to be an inherent property.

Living things not only conserve order but they also evolve toward more complex structures hierarchically organized. Piaget hypothesises:

"Life is essentially autoregulation. The explanation of evolutionary mechanisms, for so long shackled to the inescapable alternatives offered by Lamarckism and classical neo-Darwinism, seems set in the direction of a third solution, which is cybernetic and is, in effect biased toward the theory of autoregulation."
(Piaget, 1971, p. 26.)

And for him cognitive processes are results of such autoregulation. As Edmund Sinott points out in Cell and Psyche, what appears as organizing forces in the elementary forms of life and as organic drives in the higher forms of pre-human species manifests itself as conscious purpose in man.

(Sinott, 1950.)

The ubiquitous phenomenon which characterizes self-control,

regulation and maintenance found at every level of biological organization - nuclear, nucleolic, cytoplasmic, organellic, cellular, glandular, somatic, was termed homeostasis by the famous Harvard biologist Cannon (1932), and may be defined as the ability of the organism to compensate for the changes in its environment, both micro and macro, to compensate for changes in such ways that its normal functioning proceeds undiminished. Homeostasis within the body includes regulation of body temperature, water, concentration of salt, sugar and other nutrients. For instance if too much carbon dioxide, accumulates in the blood, the animal breathes faster to absorb more oxygen thus removing carbon dioxide until the balance is restored. Such a restoration of the status quo is homeostasis. Such regulative mechanisms of self correction are operative in any system, open or closed, which has a specific function or purpose. Servomechanisms designed by man have homeostatic controls built into them. In the case of evolution or development what is restored is not the 'status quo' but the normal path and direction of change. Waddington proposed the term "homeorhesis"¹ for such a situation where there is a return to the original path of development rather than a return to an original stabilized state. The homeorhetic

1. Derived from Greek word 'flow' to replace 'stasis' which implies standing still.

mechanism serves to bring back the organism to the stabilized necessary path of development or evolution. These paths or trajectories are termed "chreods"¹ by Waddington (1969). This intuitive leap of the creative embryologist in introducing a new nomenclature to represent genuinely the mechanism of autoregulation in a developing (becoming) entity, brings new dimensions in organismic biology while it allays the fear of those who attributed mechanistic connotations to the concept of homeostasis. For eg., Bonner writes:

"As a mode of describing the adjustive and protective impulses of the individual, the homeostatic analogy is convenient and useful, and it fits well the excessive demand for simplicity and economy. However, as a model for constructive behavior, it is wholly inadequate. It can tell us much about the nature of being, but next to nothing about the process of becoming: of man's hopes and dreams, aspirations and longings, dedications and commitments. Homeostasis is a static concept which conceals and distorts the essence of psychological growth and becoming" (Bonner, 1965, p. 133). (Emphasis mine.)

During development it is the richness and precise qualities of the environmental interactions, epigenetic influences as Waddington would call them, that determine the processes of developing, evolving (or becoming). Any activity guided by purpose has to have homeorhetic mechanisms which put the organism constantly in chreods which lead to consummation of its intended goal (subjective aim).

1. Derived from two Greek words meaning 'necessary path.'

The energy derived, for example, by the metabolism of nutrients are tapped by the homeorhetic mechanism to put the organism into chreods leading to maintain the biological integrity of the developing organism over time. According to Cannon (1932) in Wisdom of the Body, the human body is impeccably unified and integrated for one single purpose - survival.

Whitehead affirms that "the life aim of survival is modified to human aim of survival for diversified worthwhile experiences" (1938, p. 43). It is evident that mere survival as the primary purpose of genetic and physiological homeorhesis, is too narrow a conception given their limits, to serve as adequate mechanisms to maintain the chreods for psychological, social and spiritual purposes or ideals. More significant in man's evolution, then, are the psychological and social homeorhetic mechanisms which have to be learned and acquired; thus, such mechanisms are dependent on socio-genetic transmission which has definite effects on non-biological evolution. The concept of homeorhesis as it relates to social advancement and human evolution is tacit in our minds. Terms like self-control, security, self-fulfillment, cooperation, peace, tranquility which carry implications of homeorhesis indicate that although the term may be new the concept is not.

Certain principles established in organismic biology

are transferable to social sciences and some of the generalizations made especially from the study of mammalian group behavior have been substantiated in anthropological and sociological studies in communities around the world. Social progress can then be equated with increased homeorhesis or integration arising out of mutual cooperation which is the key to individual and group evolution. (Emerson, 1954, 1960.)

Energy spent in an inorganic system is toward disintegration while in living organisms -- open systems -- the energy is spent toward integration in the direction of higher order, of more complexity of greater specialization in organization. Increasing complexity in organisms is possible only when cells begin to coordinate their functions and activity in some way, i.e., increased homeorhesis in the organism as a whole. A degree of specialization is a prime requisite for any efficient operation and to evolve progressively, human societies must produce greater functional efficiency, i.e., increased social homeorhesis.

Whitehead writes:

"The Universe achieves its values by reason of its coordination into societies of societies, and in societies of societies of societies. Thus an army is a society of regiments, and regiments are societies of men, and men are societies of cells, and of blood, and of bones, together with the dominant society of personal human experience, and cells are societies of small physical entities such as protons, and so on.

Also all of these societies presuppose the circum-ambient space of social physical activity" (Whitehead, 1967, p. 206).

One important element in this process of integrated action - cooperation - is the moral value for the individual unit taking part in the process. Cooperation as a form of social homeorhesis is the method by which all living beings in a social system facilitate the proper channelling of their collective energy derived from their actualized potentialities in ways which are mutually beneficial.

Human Evolution and a Vision of the Future⁵

While the ethical, ideological and epistemological implications of our understanding of the mechanism of human evolution have been brought to light by the works of Dobzhansky, Huxley and Waddington, the contributions of Pierre Teilhard de Chardin, hold preeminence and are of particular significance to the scope of the present study, for Teilhard stands as a formidable figure of a pioneer in the forefront of attempts to relate evolution to man's ultimate concerns.

All during his scientific career, which was devoted to the study of geology, mammalian paleontology and anthropology,

5. References given in this section are of Teilhard de Chardin unless otherwise mentioned.

and while engaged in numerous travel adventures with prolonged stays in the orient Teilhard de Chardin had a hidden agenda constantly in his mind -- the understanding of the phenomenon of man, a creature caught between immensity and nothingness and understanding his place in the universe. His intellectual rigor and scientific training, whatever others may think or write about it.⁶

Since it is beyond the scope of the present study even to attempt to epitomize Teilhard's cosmology, only a few of the many issues that Teilhard addressed will be discussed below in the form of propositions extracted from his works that have relevance for a comprehensive value theory as envisaged by the ANISA Educational Model.

The parameter of complexity. The central theme of Teilhard's scientific thinking was evolution -- not just biological but extended to encompass the whole of reality. Outside the context of cosmogenesis, Teilhard believed anthropogenesis could not be understood. From his paleontological work on mammals he drew certain fundamental conclusions which he could convincingly generalize to aspects of man's evolution and prognosis of man's future. He

6. In the estimation of both Simpson, the American paleontologist and Medawar, the British biologist, Teilhard ranked very low as a scientist (Simpson, 1960; Medawar, 1961).

found that life was flexible and progressive; being flexible it was liable to change, and being progressive, evolution does not proceed in a random manner but it is oriented. As to the nature and direction of the orientation, Teilhard concluded that the line of evolution following the most complex brain (organized brain) was the most successful and this represented a privileged axis. For him man marks the end of one phase of development of created things and the beginnings of another new one. He shows how our puny view of man in the face of the limitless space and expanding universe can be completely reversed when we view everything from the chemical or biochemical aspect of complexity and organization (1966, p. 14-36). For him the parameter of complexity when used as the criteria enables one to distinguish a genetic classification of all creations that have evolved during eons of time. Jean Piveatu commenting on this grand scheme of Teilhard illumines Teilhard's vision.

The order of complexity corresponds to their chronological order of emergence. Now let us look at the universe from this perspective. Take the biggest objects for a start -- the nebulae. Their substance is extremely tenuous and is probably just hydrogen; that is, the simplest element of matter: one nucleus plus one electron.

Going up one step in immensity, we look at the stars. They are much more complex compared with the nebulae. But stars do not go beyond a certain stage; they are the laboratories where nature manufactures atoms from primeval hydrogen -- nothing more.

It is on the dark planets alone -- and nowhere else -- that we have the opportunity to pursue this mysterious ascent of the world towards higher complexities and where the evolutionary effort devoted

principally to the manufacture of large molecules will henceforth be concentrated.

Among these planets, at any rate, in our solar system, earth is probably the only one which is life-bearing. It may be the sole center where the synthesis of large molecules goes on, and the living creatures which inhabit it probably represent "the most complex compositions to emerge from planetary geochemistry."

Thus, life no longer looks like a dirty stain upon some tiny point in space but appears as "the specific effect of the complexification of matter" (Piveatu, 1971, p. 181).

Thresholds of evolution. Concentrating on the planet earth, Teilhard shows that billions of years of physiochemical evolution (geogenesis) followed by evolution of life (biogenesis) had to precede the emergence of thought of consciousness leading to psycho-social evolution (noogenesis), and these three distinct stages of planetary evolution represent a single but succeeding and progressive evolution in one unitary direction.

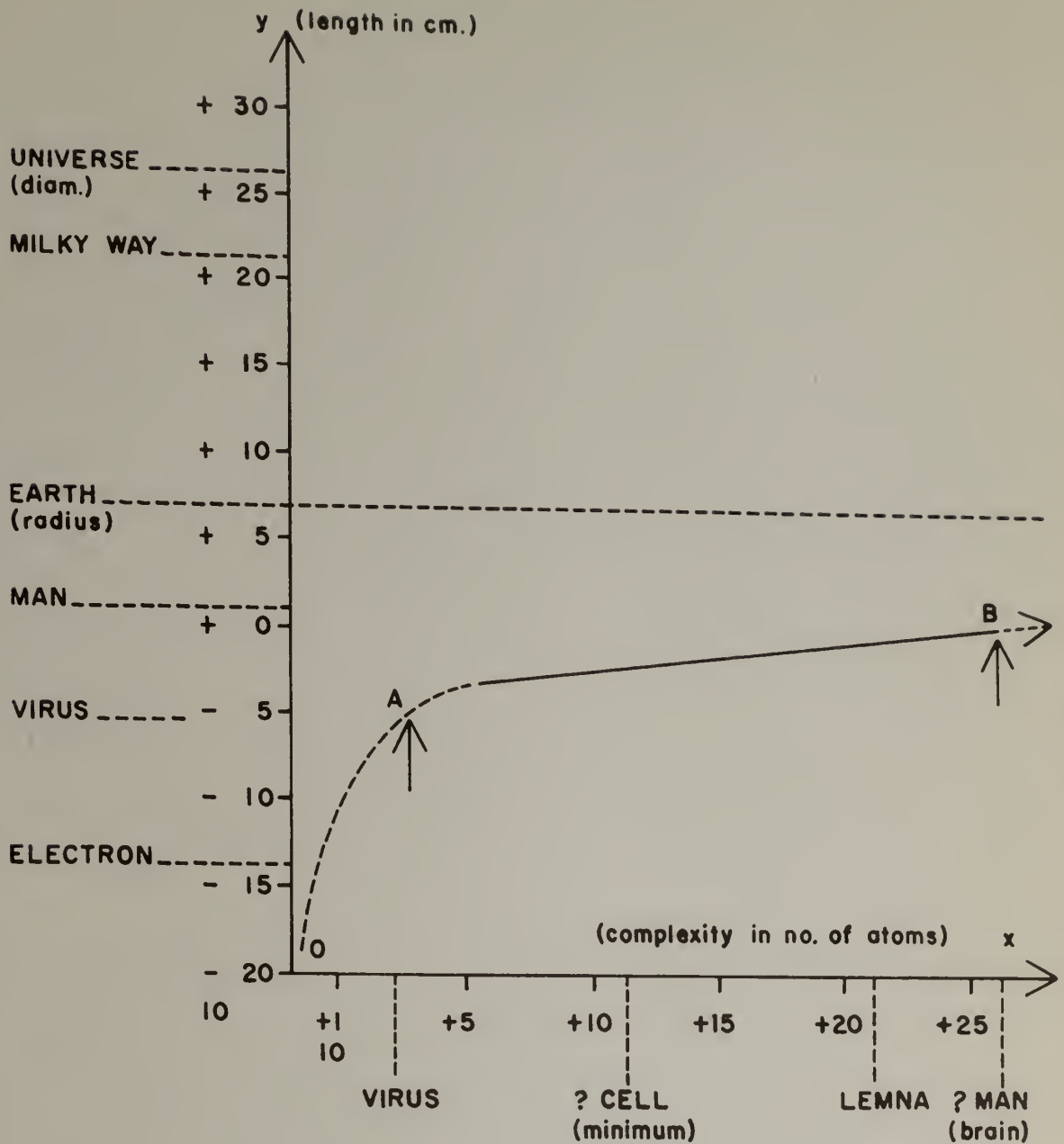
Although the parameter of increasing complexity enables us to find a meaning in the evolution of the universe, it is not sufficient, as Teilhard tells us, to determine the direction of evolution after the appearance of life (1965). The more complex the living organism, the more complex, self-centered and self-conscious it becomes. Such a form of complexity is determined due to the organ controlling the perception of the organism, the brain. The only way of evaluating the quality of the organ is by the level of organization. For him since man is the only

conscious animal with the most organized brain in this planet, he is necessarily the most valuable creation. Teilhard (1966, p. 22) succinctly portrays this in his uniquely represented 'curve of complexity' (Fig. II) in which the Y axis represents in centimeters the diameter of the principle objects in nature identified so far by science from the smallest to the largest. The X axis represents an attempt to express conceptually the degree of complexity in aggregates of matter.

Evolutionary series considered by Teilhard represents three thresholds. The threshold between matter, life and man and new qualities emerge as evolution progresses through these thresholds. This view is in complete accord with the views of emergent evolutionists, e.g., Morgan, who hold that evolution of the stuff of the universe accounts for new properties including life and consciousness.⁷ For

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7. The importance of the concept of mind and consciousness in the behavioral sciences has received attention only recently. Waddington observes:

"So long as mind remains a phenomenon unmentioned in the vocabulary of the physical sciences, one can have no complete confidence that the stock of concepts at present used in those disciplines will ever be able to encompass it." After this cautions understatement, he rightly emphasizes the positive duty of science to tackle "all aspects of the phenomena of life, including mind" (Waddington, 1957, p. 1).



NATURAL CURVE OF COMPLEXITIES *

- A. POINT OF VITALISATION
- B. POINT OF HOMINISATION
(CONSCIOUS REFLECTION)

FIG II

* .

Teilhard de Chardin. Man's Place in Nature.
New York: Harper and Row, 1966. p. 66

Morgan who recognized three kinds of natural systems, matter, life and mind, evolution is a progressive advance with novelty or the actualization of the unrealized possibilities.

According to emergent evolution, as I seek to develop its thesis, there is an increasing hierarchy of kinds of orders of relatedness ranging from those that obtain in the atom, in the molecule, in the crystal and so on near the base pyramid, to that of an order of reflective consciousness near the apex (Morgan, 1927, p. 148).

True to the tradition of emergent evolutionists defining progress, Teilhard writes: "Let me here repeat the two fundamental equations or equivalents which we have established:

Progress = growth of consciousness

Growth of Consciousness - effect of organization

(1959, p. 72).

"Planetization" of humanity. Having given a version of the evolution of the human mind, he also gives us a vision of the ultimate condition of the earth and the trend of planetary evolution. The trend prevailing in the evolution of the noosphere, sphere of consciousness and self-reflection, (the noogenesis) is toward what Teilhard designates as "planetization" and "megasyntesis" (1959). This implies radical convergence and integration of the physical, cultural and ideological branches of mankind. The megasyntesis is a gigantic psycho-biological operation in which

love and cooperation is the main agent leading to unity in diversity.

As early as in 1920 (published only in 1959), Teilhard wrote:

It is mankind as a whole, collective humanity, which is called upon to perform the definitive act whereby the total force of terrestrial evolution will be released and flourish; an act in which the full consciousness of each individual man will be sustained by that of every other man not only living but the dead (1959).

Possibilities for the future. Having clarified our ideas of the evolution of the mind and given us an idea of future possibilities, Teilhard articulates the kind of action such knowledge requires of us, for as he believed,

If progress is to continue, it will not do so on its own accord.

If indeed an almost limitless field of action lies open to us in the future, what shall our moral dispositions be, as we contemplate this march ahead?

I can think of two, which may be summarized in six words: a great hope held in common.

- a) First, the hope.... A passionate longing to grow, to be, is what we need. There can be no place for the poor in spirit, the skeptics, the pessimists, the sad of heart, the weary and the immobilists. Life is ceaseless discovery. Life is movement.
- b) A hope held in common. Here again the history of Life is decisive. Not all directions are good for our advance: one alone leads upward, that which through increasing organization leads to greater synthesis and unity.... Life moves towards unification. Our hope can only be realized if it finds its expression in greater cohesion and greater human solidarity (1959, p. 75).

C H A P T E R V I I
BIOLOGICAL DIMENSION TO THE VALUE THEORY
OF THE ANISA MODEL

Road Traversed

Both the crises in the social sciences and lack of communication among those who are involved with the study of human values, demand an integrated statement of value theory based on empirical and theoretical developments in various branches of human knowledge concerned with values. It has become evident that educational objectives cannot be adequately conceived unless they are formulated in the light of a value theory that affords a perspective on all problems involved which the theory is designed to help solve.

Attention has been drawn in the previous chapters to the need for a unified approach to the study of value phenomenon since values are derived from all aspects of human existence and experience, from one's self and one's environment. The potential impact of a comprehensive value theory well grounded in both human actualities and possibilities in understanding and guiding the process of man's true becoming, has been recognized. How values and value systems are developed are studied in strikingly divergent and piecemeal manner by various psychological and social studies according to their conception of human nature and destiny. Man's views of himself and his world, whether

validated or not, are the primary determinants of his behavior.

Perspectives obtained from current theories reviewed in chapters three, four, and five, point out to one basic concern. No matter how comprehensive becomes our understanding of the value phenomena, value systems and the conditions and contexts in which they arise, we still need a set of conceptual guidelines from some other dimension of human reality which will serve as general frame of reference to validate the postulates of a value theory. A case is made in chapter five for broadening the paradigm of value inquiry, irrespective of nature of the discipline which initiates it, by including the concepts of subjective aim and ideals¹ which in the ultimate analysis serve as the blueprint for structuring actualized potentiality - for creating values. For as expressed by Whitehead

"the life of a human being receives its worth, its importance, from the way in which unrealized ideals shape its purposes and tinge its actions. (Whitehead, 1938, p. 27.)

The views obtained on the nature of man and his destiny from the vantage point of modern theories of biological evolution as represented by the works of Huxley, Waddington and Teilhard de Chardin, have been the main thrust of

1. Pages 12-15.

chapter five, the salient aspects of which can be summarized as follows:

- a) The evolutionary account of life is continuous history of progressive advance into novelty marked by stages of increasing levels of organization and moving irreversibly toward higher forms into which have new and distinguishing properties. In the case of man consciousness² has emerged as one of the most important new properties and has made possible the creation of a culture transmissible to succeeding generations through learning.
- b) Man, because he is a cultural and conscious social being, has already influenced and will continue to influence the future of his own evolution as a species.
- c) Evolutionary progress in biological organisms, including man, can be equated with improved homeorhesis within the ecosystem of the universe.
- d) Human evolution has become the quest for perfection through consciously determined goals and ideals which in themselves become determinants of the homeorhetic path and thereby effective instruments in the evolution of humankind.
- e) Man will meet the greatest challenge in the course of his biological and cultural history as he tries to understand himself, appreciate the future possibilities open to him, and begins to take an active and deliberate hand in shaping his own destiny.

2. From the points of view of both Huxley and Teilhard de Chardin, it may appear that evolution is nothing but growth of consciousness. It may be anthropocentric to hold that consciousness to be of primary importance and in my opinion the positions of the above two scientists should be taken with the tacit understanding that this view is only relative to a truly evolutionary cosmic perspective which is that consciousness represents only one quality of an infinite number of qualities possible in the evolving universe. Emergence of consciousness on earth as a natural activity is only a recent event in a geological time scale.

The above serve as empirical and theoretical referents to the ANISA theory of value, which is outlined in the following pages.

Theories of Evolution and Organismic Philosophy

The contributions of theoretical biology whose sole concern has been the problem of the nature and evolution of organization in living things, has tremendous impact on the age old philosophical quest of the nature of reality in the universe. Sounding death knell to both mechanistic and vitalistic views of the universe, the empirical and theoretical advances in evolutionary biology, strengthen the 'organismic' view of the universe, thus supporting a major shift in the paradigm which fostered the mechanistic conception of the universe originating from classical Newtonian physics.

The fundamental thread that runs through all the advances in theoretical biology, which represents a convergence, synthesis and interpretation of break throughs of all the biological disciplines, e.g., genetics, embryology, paleontology and molecular biology, is the incontrovertible evidence concerning the high degree or organizational complexity in living things and idea that the reality of any organism cannot be understood apart from its form of

organization in the process of evolution.³ From the biologist's standpoint, the organic conception of the world involves succession in time and in space; evolution is seen as a creative advance into novelty characterized by a progressive intensification of higher principles of life.

The cosmology of Alfred North Whitehead continues to receive increasing support from the advances of modern evolutionary theories. Whitehead has always appreciated the structure of our cosmos in terms of different ontological levels. His views regarding these levels are congruent with those of Teilhard de Chardin expressed in his "curve of complexity" (p. 102).

"In surveying nature, we must remember that there are not only basic organisms whose ingredients are merely aspects of eternal objects (i.e., the ultimate particles of physics, each of which is related to everything else in the universe by its bare co-existence). There are also organisms of organisms. Suppose for the moment and for the sake of simplicity, we assume, without any evidence, that electrons and hydrogen nuclei are such basic organisms. Then the atoms and the molecules are organisms of a higher type, which also represent a compact definite organic unity. When we come to larger aggregations of matter, the organic unity fades into the background. It appears to be but faint and elementary, it is there, but the pattern is vague and indecisive. It is a mere aggregation of effects. When we come to living beings, the definiteness of pattern is recovered and the organic again rises into prominence." (Whitehead, 1925, p. 161.)

3. This has an important corollary that any static or purely conservative view of man and his social institutions, becomes untenable.

Consciousness and the "Lure" of the Future

Evolutionary theory brings to a sharp focus the relation between "life" and "matter" which has perplexed every biologist who ever tried to reconcile his knowledge of living organisms with the "mechanistic model" of the universe derived from classical Newtonian Physics. It is the basic tenet of emergent evolutionists that everything has a past from which it moves and hence all things -- matter, life, mind, consciousness, man and mankind -- are immersed in a ceaseless process of evolution and change in a continuum along a time and organizational complexity dimension. Thus evolution is a progressive advance into novelty, complexity of organization and actualization of enfolded possibilities, with matter, (geogenesis) life (biogenesis), mind (noogenesis or genesis of consciousness) as distinct thresholds or boundary conditions separating different ontological levels. On the nexus between matter and life, Whitehead remarks: "In the overall picture, there is one of life as a passage from mere physical order to mental novelty to coordinated inheritance of mental novelty" (Whitehead, 1929, p. 164).

It is evident that with the emergence of consciousness, a landmark in man's evolution, comes the possibility and increased potential for man to guide his own evolution. Awareness connotes reflection on the past, present and the future. All biological species have evolved but as Dobzhansky (1958) puts it, "only man is the sole product

of evolution who knows he has evolved and has continued to evolve." As Phenix states (1964):

"Man is engaged in a continuing adventure drawn on the new levels of fulfillment by the lure of future possibilities."

Quest for 'worthwhile experiences.' Alfred North

Whitehead proposes that we can best explain evolution of living forms if we recognize a three-fold urge in organisms, in which

the art of life is first to be alive, secondly to be alive in a satisfactory way and thirdly to acquire an increase in satisfaction (Whitehead, 1958, p. 8).

Man, as portrayed in the cosmology of Whitehead and Teilhard de Chardin, is an emergent creature and cannot be understood apart from his inner pressure of subjective aim for progressive and creative advance into novelty. Again Whitehead brings to our attention that:

the life aim of survival is modified into human aim at survival for diversified worthwhile experience (Whitehead, 1938, p. 43).

The above statements of Whitehead can be regarded as propositions which affirm the ontologically ingrained purpose in human evolution. Theories of biological evolution recognize "creative" natural selection (Simpson, 1947) as the directive force in this urge to acquire an increase in satisfaction and make a bold prognosis of man's future. Evidence from evolutionary biology points out unmistakably that since the emergence of consciousness is a relatively

new phenomenon in phylogeny, man has scarcely begun to exhaust the possibilities of creative ways of increasing the quality of life or pursuing "worthwhile experiences;" he is just in the very early stages of appreciating the "lure" of future possibilities.

One of the unique properties of consciousness is subjective awareness of knowing and knowing that we know. Knowing that we know presupposes subjective awareness of not knowing -- the ability to know when we don't know. Since the more we know the more control we can exercise over the environment, gaining knowledge is the door to increasing effectance. But we can only consciously set about to learn something if we know that there is something unknown that we want or need to know. Hence the capacity to be aware of unknowns, itself a product of evolution, becomes one of its chief servants.⁴ It enables us to relate to unknowns in ways that yield knowledge which will assist us to secure the conditions of survival and improve its quality. One of the most problematical unknowns is our own future. How we relate to that unknown concerns the central dynamic in value formation. The structuring of this unknown -- the future -- and the orientation toward possibilities of 'diversified worthwhile experiences' or anticipation of

4. I am greatly indebted to Professor Jordan for sharing this during a discussion on July 30, 1974.

actualizing potentialities, gives rise to the formation of ideals. An ideal is the structuring of the unknown; it is a non-actual reality effective in the present as it influences our interaction with the environment thereby restructuring the pattern of energy utilization which means restructuring values. Human goals and aims are not only motivated by individual needs but also by the ideals which one strives to actualize.

It is an incontrovertible fact that man's awareness of the future possibilities or unactualized potentialities makes man his own maker. This has moral consequences of the most profound nature. As Whitehead puts it: "The effect of the present upon future is the business of morals" (1967, p. 269).

It is these ideals, then, which act as the goad for structuring and restructuring the pattern of energy utilization of man's already actualized potentialities as he moves toward the future. The role of ideals in understanding the art of man's becoming has been recognized by all writers on self-actualization. Commenting on mystical experiences William James writes:

The appearance is that in this phenomenon something ideal, which in one sense is part of ourselves and in another sense is not ourselves, actually exerts an influence, raises our centre of personal energy, and produces regenerative effects unattainable in other ways. (1958, p. 394.)

While Humphries (1968) points out:

All writers on the subject of spiritual development are agreed on the power of the ideal to draw one upwards to the goal. . . . A noble ideal, if firmly held and steadily pursued is the most powerful agent for self-unfolding known to man.

Human values and experiences cannot be adequately understood without extending their frame of reference from the merely biological and biosocial to the ideal or transcendent dimension. A theory of value is inevitably a facet of any theory of being and becoming because becoming presupposes some actuality in process, and process presupposes potentiality. By choosing ideals, man takes charge of his own destiny. This conscious control is isomorphic with learning competence; it enables man to arrange his own environment and guide his own interaction for actualization of some ideal. Mumford writes:

"Every transformation of man except that perhaps which produced neolithic culture, has rested on a new metaphysical and ideological base; or rather upon deeper stirrings and intuition whose rationalized expression takes the form of a new picture of the cosmos and the nature of man" (Mumford, 1962, p. 171).

If education is to transfer and transform the cultural heritage consciously, the role of ideals in actualizing future possibilities and potentialities of man and mankind, can hardly be exaggerated. The new definition of culture given by Sorokin becomes very relevant in the light of the above consideration:

Culture may be defined as the human activities formulating progressively understanding and appreciating and actually creating, all that which is possible to classify within the broad domains

of knowledge or truth, aesthetic activity or beauty and moral achievement or goodness (Cowell, 1970, p. 291).

With such a comprehensive view of evolution, with the role of ideals and values in it, and such a redefinition of culture, many branches of human activity will assume new directions. Education as conceived by the ANISA MODEL will be the chief among them.

ANISA Theory of Value

The following propositions characterize the foundations for the ANISA value theory and represent the general orientation and guiding principles of any future value inquiry in the Model's development. These propositions which are necessarily presented in a very general form can be further elucidated only within the context of the philosophical base of the ANISA MODEL (Jordan and Shepard, 1972) and the theories of development (Kalinowsky and Jordan, 1973) and volition (Conway, 1973) derived from its philosophy.

Man's becoming involves the process of actualizing his potentialities which is sustained by interaction with the environment. The actualized potentialities are structured and these structures determine learning. The patterns of utilization of the energy available to the becoming man are when they are relatively enduring, called values.

Value formation is the patterning of the expression of the available energy due to the functioning of structures formed as a result of the actualization of the potentialities from all its categories, viz., psychomotor, perceptual, cognitive, affective, volitional fused with the information about the environment.

The fusion includes volitional elements and hence values always have an evaluative or decision making component. This aspect has implications for increasing individuals effectance thus emergence of values is inextricably bound with the process of becoming.

The pattern of energy utilization and the ends to which the energy is used define the self and constitute the structure of personal identity.

Chief among the factors in the dynamics of structuring the pattern of energy utilization are the subjective aim, purpose, ideals and the "lure" from the environment. In the ultimate analysis these factors become the primary determinants in human behavior.

Values and the value systems of the individual, the society and the culture become valid only to the extent that the determinants that structure the energy pattern themselves are validated.

The subjective aims or the ideals that serve as the 'lure' for the structuring of the pattern of utilization of human energy obtain their validation on the basis of whether or not they facilitate homeorhesis both in ontogenesis and phylogenesis, to put mankind into chreods leading to greater levels of collective organization and human solidarity because this guarantees and increases the quality of survival.

E P I L O G U E

BUILDING A SCIENCE OF EDUCATION: PROSPECTS

It is my firm conviction that the emergent concepts arising from the cross fertilization of all those studies that have to do with our knowledge of man and his becoming should be the corner stones of the future edifice of the science of education. "All systems of education and of research," observes Rene Dubos, "have been organized on an analytic pattern. What science has been successful at, by remaining for 350 years faithful to the Cartesian doctrine, is to take any kind of problem and dissociate it into its components. This is what universities are organized to do both research and training" (Dubos, 1967, p. 13). No major breakthrough in education can come about unless there is a high degree of integration and application of the vast body of research from several disciplines that have contributed to our understanding of human growth and development. ANISA is a mission-oriented institution that has been precisely designed to provide the kind of integration sorely needed for research and action, and has provided a blueprint for a system of education for man to be able to actualize his full range of potentialities. The ANISA educational model makes no pretention to completeness in its articulation of the basic constructs that go into building its theory.

In an age of piecemeal analysis ANISA's venture may seem to be a hopelessly broad undertaking. Educators of this era find themselves in the same positions as the scientific pioneers of the earlier centuries. No systematic body of knowledge for a scientific foundation for education can be built up from any one discipline. Without such a foundation no superstructure can be built. It is clear that the primary educational need of our time is to formulate, however tentatively, the underlying principles, assumptions, and theories upon which educational research, planning, and implementation can rest and with that as the basis seek to build up a systematic body of knowledge by testing out hypothesis generated from the theories.

Educators may ignore or be apathetic to the problem of systematizing educational theory building on a scientific basis, but in the meantime, schools and other related institutions are making decisions without the benefit of any basic philosophy or organized body of knowledge to guide their decision making. It may be argued that without such collaborative research, the principles of the science of man - his being and becoming - may not be understood. But with 6000 years of social history and all the wit and wisdom of the scientists, philosophers, saints, and seers at our disposal, it would seem that at least a speculative beginning on the science of man and his becoming should be made. Resorting to speculative leaps should not be

labelled as a subjective treatment of the inquiry. The biggest blind spot that thwarts such attempts by educators and behavioral scientists is their inability to admit, as Bonner (1965, p. 32) puts it, "that 'objective' knowledge can be obtained by 'subjective' means."

Educators, who are in the business of building a 'science of education' must take lessons from the philosophy, development, and history of science; one of the lessons conveyed to us by developments in modern physics is the key role of speculation in science. Indeed the great physicists of the twentieth-century such as Einstein, Max Planck and Heisenberg, as affirmed in their biographies, arrived at their theories by means of speculative thinking. Complete empirical proof is neither possible nor necessary in science, for "proof" says Eddington (1929), "is the idol before whom the pure mathematician tortures himself."

It is possible, after testing out the relevant hypotheses, that no discoverable principles exist in the science of man and even if they exist there is no certainty that universal agreement on them can be achieved. But a similar uncertainty holds true in all the other scientific endeavors as well. Newtonian physics was challenged by the theory of relativity. Those before Einstein regarded Newtonian Physics as virtually a divine revelation of the nature of reality; subsequently this belief had to be modified. The atom defined as the ultimate particle has finally come apart

and startled the world. As some one remarked, "The path of scientific discovery is always strewn with wrecks of discarded hypothesis." And yet, those false assumptions served an essential purpose in the progress of science. Science is not an unchanging, static set of propositions, nor a permanent body of approved facts. Quite obviously it changes and the changes are not merely additions of knowledge but also revisions of basic tenets and rejections of previous assumptions, now demonstrated to be inadequate.

Discovery of pseudo-bricks in the structure of science has not deterred the scientist from contributing to the building of hypotheses, to move from failure to victory in his conscious attempt to control natural forces. It would seem logical to assume even though our present day knowledge of the true nature of man, his ultimate destiny, and the ecological system that maintains his integrity individually and collectively is limited, an attempt to speculate on them is worth while.

In education there is an implied frame of reference in certain guiding principles that are commonly used, but these are rarely made explicit. In ANISA's view, if they are formulated clearly and used as a starting point it would facilitate the much needed communication among the members of the community involved in educational practice. It would likewise make possible the building of a coherent

body of knowledge that would make education relevant to and more powerful in serving the needs of everchanging societal needs.

An essential part of any scientific inquiry, as Phenix puts it, is the creation of conceptual categories suitable to the subject matter to be investigated which then, of course, should be used to construct theories and paradigms. A theory, if it is to be scientific, cannot remain aloof in the world of logic and conceptual categories but must have implications for action. A significant property of scientific theories which is not so often remembered by those who discuss it, as observed by Waddington (1962, p. 12) is that 'its value is quite largely dependent on its power of suggesting the next step in scientific advance. In fact at the growing edges of science the stimulating and suggestive theory is often preferred to one which may be less open to criticism but which seems to lead us nowhere in particular.'

APPENDIX

A Summary Statement on the ANISA* Model¹

The ANISA model represents a comprehensive educational system functionally defined by specifications which insure its replicability, evaluation, and refinement. The specifications set forth educational objectives pertaining to the actualization of human potential and explanations of how to achieve them. These objectives and explanations are derived from a coherent body of theory which has been deductively generated from a philosophical base and inductively validated to whatever extent possible by findings from empirical research.

The philosophy underlying the model is organismic in nature; it defines man as a spiritual as well as a material being; explains his reality in terms of the process of his becoming (actualization of potentiality), accounts for his qualities of transcendence and immanence, and sets forth fundamental ontological principles which explicate man's relationship to the universe.

The body of theory derived from the philosophy includes:

A Theory of Development which defines development as the translation of potentiality into actuality and equates that translation with

creativity; establishes two broad categories of potentialities -- biological and psychological; identifies proper nutrition as the essential element in the development of biological potentialities and learning as the key factor in the release of psychological potentialities; establishes five categories of psychological potentialities -- psycho-motor, perceptual, cognitive, affective, and volitional; establishes interaction with the environment as the means by which development is sustained; fixes three basic categories of environment (physical, human and the unknown) and establishes the Self as the micro-cosmic reflection of the three environments and the most constant aspect of the environment it experiences; and, categorizes interactions in terms of their power to facilitate development and safeguard survival.

A Theory of Curriculum which fixes the overarching goal of education as the actualization of human potentialities and their structuring into identities around ideals which guarantee survival and perpetually improve its quality; establishes two categories of goals or objectives of the formal educational system -- content goals and

process goals; specifies the substance of the former as the information culture has accumulated organized in terms of the classification of environments, including the symbol systems used to convey that information, and the substance of the latter as formation of internal structures on which learning competence depends (i.e., content goals may specify what to think about, while process goals concentrate on how to think); accounts for the emergence of personal identity (character formation) in terms of value formation and defines values as the relatively enduring structurings of potentialities (process) as they are actualized and integrated with information (content) assimilated about the various environments; and, specifies three value sub-systems (material, social, and religious/aesthetic) on which three higher order competencies rest (technological, moral and spiritual/philosophical) and which combine to form the total values system that constitutes the personality -- the Self.

A Theory of Pedagogy which defines teaching as arranging environments and guiding the child's interaction with them for the purpose of achieving the goals specified by the curriculum theory;

outlines the diagnostic, prescriptive, speculative, experimental, and improvisational aspects of arranging environments and guiding interaction so that instruction is individualized and learning particularized thereby guaranteeing equality of educational opportunity.

A Theory of Administration which identifies two basic functions of administration which must remain in dynamic equilibrium -- leadership and management -- and defines them in terms of service consistent with purpose as specified by the philosophy; provides the rationale for differentiating the staff, maintaining morale, establishing institutional priorities, assessing needs, identifying resources, determining feasibility, and allocating resources to achieve objectives as efficiently as possible; provides the means for institutional self-renewal; and, accounts for the necessity and nature of community and home involvement.

A Theory of Evaluation which designates comparative analysis of children's interactions with particular environments and their developmental consequences as the focal point of inquiry; seeks to relate means to ends, distinguishing

efficient from final causes; and allies the purpose of evaluation with the heuristic, explanatory, and predictive functions of research and science.

Because the model rests on the universal processes of growth and development, it has cross-cultural applicability and addresses directly the problem of how to achieve equal educational opportunity.

1. See Appendix in Raman, S. P. (ed.) Nutrition, development and learning - selected readings. New York: MSS Information Corp., 1974.

* ANISA is both a word and an acronym. As a word, it has Greek and Latin roots which refer to a flowering tree whose fragrance has made it attractive as a symbol. It has been adopted to represent "the tree of life" -- an ancient symbol connoting shelter, beauty and grace, and the perpetual growth and fruition of organic life. As an acronym, ANISA stands for American National Institutes for Social Advancement, an incorporated not-for-profit organization under whose auspices the efforts to formulate the model were undertaken.

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